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A PRELIMINARY NOTE ON THE STERILIZATION AND ABSORBABILITY OF CATGUT.*

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Hundreds if not thousands of pages have been written, each new paper asserting that the ideal suture or ligature has been at last discovered, but the fact that new methods are still being invented is a strong argument that the end is not yet. The present work is a preliminary effort to put on a demonstrative basis the questions: (1) as to what are the best materials for ligatures or buried sutures; (2) which is the easiest and at the same time the most reliable method of sterilization; and (3) what is the durability of absorbable material when buried deeply in the tissues. We are led to question most of the statements made concerning the durability of ligature materials prepared by some of the leading manufacturers as well as by our own methods, by their early disappearance on the one hand and their apparently absolute permanence when expected to disappear in from 30 to 40 days. Thus it will be seen that chromicized kangaroo tendon, which

is supposed to be absorbed in about six weeks, was found unchanged when case No. 554, 1903, came back for a reopening of the wound fifteen months later.

The qualities of an ideal suture or ligature, beyond ease of mechanical application, are durability until healing has taken place, disappearance after this time, primary asepticity and the maintenance of this quality. Primary asepticity is securable we believe for any ligature or suture material, but absolute maintenance of this is only certain with substances such as silver wire and silk worm gut, which cannot be penetrated by germs or their products, i. e., are non absorbent. Upon the other hand the presence of these by their mechanically irritating the tissues, has again and again led to late infections and the necessity for their removal. Absorbable ligatures can only be certainly maintained aseptic, if they are not to rapidly disappear, by their saturation with some germicidal substance, which will slightly, if at all, lower the tissue resistance. If, at the same time, this chemical can increase the life of the suture or

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ligature sufficiently to secure mechanical stability until an unyielding union has been secured, the ideal preparation has been obtained. We must emphasize what has been too often overlooked, that eventually the stability of the wound must depend upon its inherent capacity to resist stretching, not on the mechanical support afforded by nonabsorbable sutures, because the moment the sutures become tight by stress on the tissues, hyperæmia is induced, the tissues revert to the cellular state, and the mechanical support of the stitch ceases to be effectual, because it cuts loose on one side or the suture becomes entirely free, lying in a bed of granulation tissue.

The primary quality when an absorbable material is used is its freedom from all pathogenic organisms and especially from the spores of anthrax. The absence of these latter may be secured by employing animal tendons, but as catgut is practically the only material fitted for the majority of purposes, the danger of anthrax is a very real one.

Innumerable methods will secure against everything hurtful except anthrax; only a few are sure to destroy this germ or its spores, such as prolonging high temperature, but many inconveniences may attend the employment of caloric which, even when most carefully done, usually materially reduces the tensile strength.

A series of experiments undertaken at my instance by Dr. F. R. Waldron in the Surgical Laboratory of the University of Michigan show that sterilization by the Claudius method is entirely reliable.

Strands of No. 2 Kny-Scherer catgut,

wound on glass rods and pieces of large white silk, were used.

Anthrax was grown on potato in the incubator at body temperature for 40 hours, when abundant spore formation was shown by the microscope. Large amounts of growth were thoroughly emulsified in sterile distilled water.

The catgut and silk were immersed in the emulsion for 24 hours at room temperature. They were then removed and dried for 24 hours in the incubator in sterile Petri dishes. Spores were demonstrated in the emulsion after removal of the suture material. As control, both catgut and silk grew anthrax abundantly in 24 hours when placed in beef tea.

The Claudius solution was made by grinding together one gramme of pure iodine crystals and one gramme of potassium iodide and adding 100 cc of distilled water. (This is not the manner of combination used by Claudius but the same proportions are used and a more complete solution of the iodine is obtained.)

The silk and catgut were immersed in the Claudius solution and removed at intervals as follows: Exp. 1—A piece of silk removed in one minute and put without washing in beef tea, showed no growth at the end of 48 hours and agar inoculated from the beef tea showed no growth. The piece of silk was transferred to a fresh tube of beef tea, which showed a growth in 24 hours. Anthrax was demonstrated in the latter.

Exp. 2—A piece of silk removed in one minute was washed in sterile distilled water until the iodine color had almost disappeared and put in a tube of beef tea. Anthrax was demonstrated in this in 24 hours.

Exp. 3—A roll of catgut, removed in

three hours, was washed in sterile water for $3\frac{1}{2}$ hours and put into a tube of beef tea. The gut was still very black after washing, but was completely bleached during the first 24 hours in the beef tea, during which time no growth was apparent. It was then put in a fresh tube of beef tea, this process being repeated three times with no growth.

Exp. 4—A piece of silk removed in $2\frac{1}{2}$ hours was washed in 200 cc of sterile distilled water for three and one-half hours, when it was still a good brown. It was then put in a tube of beef tea which bleached it completely but showed no growth. Four changes of beef tea failed to show any growth. The silk was then placed in the subcutaneous tissues of a guinea pig which showed no ill effects after forty days.

Exps. 5, 7, 9, 11, 13, 15 and 17, rolls of catgut removed at 24 hours intervals, were treated as in exp. 3, none of them showing anthrax. Exps. 6, 8, 10, 12, 14, 16, and 18, pieces of silk removed at 24 hours intervals, were treated as in experiment 4, none of them showing anthrax.

Conclusions—1. That the iodine carried over on the suture material will prevent growth of anthrax spores until sufficiently diluted.

2.—That silk and catgut, soaked in an emulsion of anthrax spores for 24 hours and thoroughly dried, are rendered free from living organisms by at most $2\frac{1}{2}$ to 3 hours immersion in the Cladius solution.

The silk was used for the animal experiments because it was not thought that the spores would penetrate the gut. It is not considered proven by these experiments that gut from an animal dying or affected with anthrax, in which the spores

may be deeply incorporated in the gut, is made sterile by this process, but pieces of No. 1 and No. 2 gut, exposed to Cladius solution for eight days, mounted in paraffin and sectioned, showed microscopically an even penetration of the iodine which, in connection with these experiments, makes sterility seem likely.

SECOND SERIES.

Pieces of coarse cotton, grocer's twine, were soaked for 24 hours in emulsions made up of distilled water and potato cultures of anthrax, potato and hay bacilli, all showing abundant spores. Cover glasses were also smeared with these same potato cultures, both twine and cover glasses were afterwards very thoroughly dried in the incubator. As control both pieces of twine and cover glasses grew their respective bacilli when put untreated into tubes of beef tea.

The pieces of twine and cover glasses so prepared were all immersed in the Cladius solution and removed at intervals as follows:

Exp. 1—A piece of twine, removed in five minutes, was washed in a solution of sodium hyposulphite until the iodine color was removed, then washed in sterile distilled water and put in a tube of beef tea. There was a growth of anthrax in 24 hours.

Exp. 2, 3—Piece of twine which had been in the hay and in the potato emulsion removed in five minutes and treated as in experiment 1 showed growths of their respective organisms.

Exp. 4, 5, 6—Pieces of twine removed in five minutes, thoroughly washed in sterile distilled water until the iodine color was almost removed showed growth of their respective bacilli, after being in beef tea for 24 hours in the incubator.

Exp. 7, 8, 9—Pieces of twine removed at the end of five minutes were put in tubes of beef tea without any treatment and failed to show any growth at the end of 24 hours in incubator. After being transferred to fresh tubes of beef tea, there were growths of the respective bacilli in 24 hours.

Exp. 10—A cover glass, removed at the end of 30 minutes, was washed in the sodium hyposulphite solution until free of iodine color, then washed in sterile distilled water and put in tube of beef tea. This was grown at incubator temperature for 24 hours, when a growth of anthrax was proven.

Exp. 11, 12—Repetitions of exp. 10 with cover glass smeared with hay and potato spores also gave a positive result.

Exp. 13—A piece of anthrax twine, removed at the end of 24 hours from the Claudius solution, bleached in sodium hyposulphite and washed in sterile distilled water, was put in a tube of beef tea. No growth in 24 hours after repeated transfers.

Exp. 14, 15—Repetition of exp. 13 with hay and potato twine gave negative results.

Exp. 16—Three cover glasses smeared respectively with hay, potato and anthrax spores, were removed in 24 hours, washed in sodium hyposulphite solution and sterile distilled water and put in tubes of beef tea, all failed to show growth.

On each succeeding day for three days, anthrax twine and cover glasses were removed, treated as in the preceding experiment with no growth.

After the first 24 hours, the iodine in the Claudius solutions which contained

the hay and potato twine were thrown out of solution, probably by the large amount of organic matter carried over by the twine from the emulsions.

As control, several drops of the sodium hyposulphite solution, used to neutralize the iodine and several drops of the Claudius solution were added to tubes of beef tea. These were inoculated with hay, potato and anthrax emulsions and all grew their respective bacilli abundantly.

Conclusion—1. That heavy cotton growers' twine, soaked for 24 hours in an emulsion of the spores of anthrax, hay or potato bacilli, and thoroughly dried, is rendered free from living organisms by at most 24 hours exposure to the Claudius solution.

2. That cover glasses, smeared with potato cultures of anthrax, hay or potato bacilli containing spores, and thoroughly dried, are rendered free from living organisms by at most 24 hours exposure to the Claudius solution.

Tensile strength, first series—For this series, No. 2 Kny-Scherer gut was used, each ten foot length being divided into three equal pieces one of which was not treated but kept for control, one was treated by formalin, by the method recommended by W. J. Stone, and the other was put without preliminary treatment into the Claudius and other iodine solutions. Those treated by chemicals were wound on glass rods. All were soaked in 3 per cent. carbolic solution, as recommended by Claudius before testing.

The figures given in the tables below are pounds of tension required to break the gut.

1. Full strength Claudius used.

	Formalin.	Claudius.	Untreated.		Formalin.	Claudius.	Untreated.
	4.5	11	9.25		7	6.5	6
	6	2.33	8		8	6.5	6
	—	—	—		8	8	8
Total	10.5	13.33	17.25		8	7	8
Average	5.25	6.66	8.67		Total	31	28
					Average	7.75	7
							7

2. Half Strength Claduus used.

	Formalin.	Claudius.	Untreated.		Formalin.	Claudius.	Untreated.
	10	7	8.5		6.5	50 per cent.	
	10.5	9	9		alcohol, 100 cc.		
	6.5	4	8				
	7.5	4	9				
	—	—	—				
Total	34.5	24	34.5		Formalin.	Claudius.	Untreated.
Average	8.5	6	8.5		18.5	15.5	10.5
					Average	9.25	7.25
							5.25

3. One-fourth strength Claduus used.

	Formalin.	Claudius.	Untreated.		Formalin.	Claudius.	Untreated.
	9	8	10.5		6	6.5	5.5
	9	7.5	10.5				
	—	—	—				
Total	18	15.5	21				
Average	9	7.75	10.5				

With knot.

	Formalin.	Claudius.	Untreated.		Formalin.	Claudius.	Untreated.
	6.25	6	4.25		9.5	3.	8
	—	—	—		9	3.5	8
Total	18.5	16.5	16		Total	18.5	16
Average	9.25	8.25	8		Average	3.25	8

4. One-sixteenth strength Claduus.

	Formalin.	Claudius.	Untreated.		Formalin.	Claudius.	Untreated.
	9	7.5	8		5	3	5
	7	7.5	8				
	—	—	—				
Total	15	15	16				
Average	7.5	7.5	8				

With knot.

	Formalin.	Claudius.	Untreated.		Formalin.	Claudius.	Untreated.
	6.5	6	6.5				
	—	—	—				

5. Iodine one gramme. Absolute alcohol 100 cc.

2nd series, No. 1 Kny-Scherer gut after the division into three pieces as before, was rolled with no pressure or confinement: this was done because of the marked physical change and loss of tensile strength of some of the gut, carefully rolled on glass rods in the first series. Ten foot strands from the same roll were used, one series of ten untreated, one

series treated by formalin 4 per cent. for 36 hours and washed in distilled water for 12 hours, one series with second formalin series, being immersed in the Claudius solution for ten days. The formalin and plain Claudius series with half the untreated series were immersed in plain water before testing. The other half pieces of the untreated series were tested dry as shown by the tables.

Iodine before immersion of gut 9.4 Mg. per cc., Iodine after ten days immersion of gut 1.14 Mg. per cc.

Formalin.	Claudius.	Un- treated. wet.	Un- treated. dry.
1. .75		1	4.
with knot .5	1.	1	2.25
2. .5	1.75	2	4.5
with knot .5	1.5	1.5	2.
3. .75	2	2.5	4.5
with knot .5	2	2	3
4. .25	.25	1.5	4.5
with knot .25	.25	1.5	3
5. .5	.5	1.	3.5
with knot .25	.25	.5	1
6. 1.25	2	1.75	4.5
with knot 1.5	2	2	2.5
7. .25	.25	1	4.5
with knot .25	.25	.5	2
8. .5	1.5		1.25
with knot .25	1.5		1
9. 1	3	2.5	6.5
with knot 1	2.5	2	3.5
10. 1	1.75	2	6.5
with knot 1	2	2	4.
<hr/>			
Totals 6.75	14.5	15.25	44.25
with knot 6		13	25.25
Average .675	1.45	1.69	4.455
with knot 6	1.325	1.44	2.525

First tensile strength experiments.
Conclusions:

1.—That tight winding of the gut markedly affects the gut physically and reduces the tensile strength.

2.—That solution of iodine and potassium iodine do reduce somewhat the tensile strength of the gut.

3.—That more dilute solutions do not obviate this drawback except the most dilute examined (No. 4, 1st series) which

is probably not sufficiently germicidal.

4.—That alcoholic solutions preserve or increase the tensile strength except in dilutions which require the addition of potassium iodide to put the iodine in solution.

5.—That with a knot in the continuity of the gut, greater tension was almost invariably necessary to break the iodine gut than the wet untreated gut.

6.—That the iodine gut is apparently somewhat more elastic than the wet, untreated gut.

Second series of tensile strength, experiments. Conclusions:

1.—That the tensile strength of No. 1 gut is lowered by the exposure to the Claudius solution, more so in case it has previously been exposed to formalin.

2.—That certain pieces of gut are absolutely worthless as ligature or suture material after exposure to the Claudius solution.

3.—That with a knot tied in continuity the relative loss of strength is much less.

4.—That in replacing unused gut in the Claudius solution, aseptic gut only must be replaced, as the iodine was present in the solution in less than one-eighth its original strength. The gut was kept in a glass stoppered bottle tightly closed.

Points yet to be determined:

1.—Is the alcoholic solution of iodine as germicidal and penetrating as the watery?

2.—Has the potassium iodide any effect on the tensile strength of the gut or upon the value of the solution as a germicide?

3.—Are there chemical constituents in some gut which react to iodine in a way unfavorable to the tensile strength?

The preliminary notes on the absorbability of chromicized cat gut, which were

as follows were made by Dr. C. F. Tenney.

In the following experiments the approximate time for absorption was determined for cat gut, which had been chromicized in chromic acid solutions of different strengths. The cat gut used in the experiments was prepared at the University hospital in brief as follows: strands of gut about five feet long are wound into skeins and these skeins are immersed in chromic acid solution for 48 hours. This solution is prepared by adding to a 5 per cent. carbolic acid sufficient chromic acid to render the solution of the desired strength. The skeins are then placed in a dry heat sterilizer at a temperature of 80 degrees C. for three hours, which suffices to drive off the moisture. The dried skeins are then boiled in absolute alcohol for three hours, the next day the boiling is repeated for five hours and on the third day for ten hours. The gut is then placed in sterile glass tubes and the tubes are sealed in the flame.

In the experiment to be described below, rabbits were used in testing rapidity of absorption of the cat gut, and all anti-septic operative precautions were taken.

Experiment 1.—Gut from 1-4000 solution of chromic acid was loosely wound into three bundles of a few strands each. Bundle number one was placed in the peritoneal cavity, number two in the abdominal muscles and number three in the superficial fascia of an animal. These three bundles were removed at the end of twenty days and allowed to dry in the air. Upon examination, it was found that while the three bundles were about equally absorbed, a slightly greater degree of absorption was found in the case of the muscle bundle. They were about one-

half absorbed and retained fully one-third their original strength.

Experiment 2.—Since the greatest absorption seemed to be in the muscle, the muscles of the right thigh of a rabbit were next used and three more bundles of gut from a 1-4000 solution were tested. The first bundle was removed at the end of twenty days, the second bundle at the end of thirty days and the third bundle at the end of forty days. Bundle number one corresponded to the muscles bundle of experiment one and about the same absorption took place. Bundle number two was two-thirds absorbed and a strand of it was very easily broken, while bundle number three was a white, softened mass, all of its original form and strength gone.

Experiment number 3.—In this experiment three bundles of gut were inserted in the thigh muscles as before. Bundle number one was from 1-5000 solution, bundle number 2 from 1-6000 solution and bundle number 3 from 1-7000 solution of chromic acid. These bundles were all removed at the end of twenty days and upon examination it was found that the degree of absorption increased as the strength of solution had decreased. Bundle number one, while still retaining its form had lost its strength, only a slight pull being necessary to break it. Bundle number two was very friable and would not withstand the slightest pull, while bundle number three was a softened mass. A strand of gut from 1-8000 solution was used for interrupted sutures in uniting the skin edges; the tie ends could be separated from the skin at the end of ten days.

By way of conclusion, our experiments tend to show that the 1-4000 gut becomes absorbed in 15 days, the 1-5000 gut in about 20 days, the 1-6000 in 15 days, the 1-7000 in 12 days, while the 1-8000 gut becomes absorbed in the tissues in about ten days.

THE MEDICAL INSPECTION OF SCHOOLS.*

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Detroit.

A systematic medical inspection of schools has been in vogue in Europe for a number of years, but in this country it was first introduced in the public schools of Boston in 1894. Since that time many cities have adopted such a system of inspection. There are several results to be accomplished by this work. The first and primary reason on account of which this work is done is for the prevention of the spread of communicable diseases, by excluding from school and subsequently quarantining any unrecognized or undetected cases of such diseases as may have found their way to school. The second object is to discover children with diseases that are not contagious or with removable physical defects, which interfere with their progress in school. Under this head would come a systematic examination of the eyes and ears of children, and this subject has been taken up, as you know, by this society and is being worked out for the whole state by a committee to which it has been referred. The third purpose of medical inspection of schools is to note the growth and development of school children. This question is of great importance and is, indeed, a study in itself. The relation of a child's physical growth and development to its capacity for mental work has been definitely established and should be considered by parents, educators, physicians, and sanitarians.

All of the above inspections have to do directly with the school children but along with this work there should be an

examination of the school buildings with special reference to their heating and ventilation and all school authorities should be required to bring the sanitary condition of the buildings up to an established standard.

The work undertaken in Boston in 1894 was soon followed in New York, Chicago, Philadelphia, Detroit and many other cities, until now it is practiced in one or more of its phases in a great many cities all over the country.

In Detroit a daily medical inspection of school children for the purpose of detecting and excluding contagious diseases was inaugurated in February, 1902, and about the same time a systematic study and examination of the air in school rooms and buildings was begun. The medical inspection was first done by volunteer inspectors, inasmuch as no money was available for the purpose. The general plan is similar to the one employed in Chicago and is as follows: A medical inspector visits each school in the morning at about the same hour every day. Before his arrival each teacher will have sent to the principal's room any pupil who may be suspicious of having some communicable disease or who has been absent from school. The medical inspector immediately examines all pupils thus detained in the principal's room and any child found with a communicable disease or any symptoms of such disease is at once sent home with a card signed by the principal of the school informing the parents of the child's condition and advising them to send for a physician. In no case does the medical inspector prescribe for the child or have

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anything to do with it except at school. Whenever a child is excluded on account of a disease required to be quarantined by the Board of Health, notice is sent immediately to the Health Officer. The home of the child is then quarantined and the school, or at least the room from which the child was taken, promptly and thoroughly disinfected. For the examination of throats of children the inspectors are provided with wooden tongue depressors, each one to be destroyed immediately after using.

This plan was, as I have said, adopted in Detroit in February, 1902, and the work done by the volunteer physicians. The results obtained by this experiment in four schools were so satisfactory that on March 1st of the same year twenty-six schools were added to the list and on May 1st the number was increased to fifty, with one volunteer inspector working daily in each school. The following school year, the work was continued in the same manner and in the spring of 1904 an appropriation was granted for the purpose of carrying on the work in the fall. The amount allowed was \$2,500, consequently the work had to be distributed so as to cover all of the public schools. There are now ten inspectors working, each one visiting seven schools daily. The work is done in the same manner as before except that each physician has seven schools to visit in place of one. Besides these seventy schools, we are now inspecting four parochial schools and next school year we hope to cover all of the parochial and private schools and in this way offer protection against contagious disease to every school child in Detroit. The work in the private schools is being done by volunteer inspectors.

The diseases for which children are excluded from Detroit schools are as follows: Scarlet fever, diphtheria, tonsillitis, measles, roetheln, mumps, smallpox, chicken-pox, whooping-cough, pediculosis, ringworm, impetigo, scabies and contagious eye diseases. To give you an idea of the scope of the work done during the past year allow me to cite a few figures. The total number of pupils examined during the year to June 1st, was 24,096, number excluded, 1678. Of these exclusions, 17 were for scarlet fever, 21 diphtheria, 570 tonsillitis, and there were 372 cases of pediculosis. From these figures as samples, some of the results may be deducted. Now let us look at some individual cases: On October 25th last, Reuben S. returned to school after having been absent two days. Dr. Hills examined the child and found him to have symptoms of scarlet fever. The patient was sent home as were also his brothers and the health officer notified. After the diagnosis had been verified, the house was quarantined. On November 11th another child in the same family came down with the disease. Had it not been for the examination at the school, the first case would have remained in the school room during the period of desquamation and a number of cases would undoubtedly have resulted. As it was, no additional cases followed. Again on Nov. 10th, Dr. Kuhn excluded from the Campau School, Helen W., who had remained at home for a day on account of a sore throat. A culture was taken which showed the case to be one of true Klebs-Loeffler diphtheria. On Nov. 2nd, a case of diphtheria was excluded from the Newberry School. Dr. Richards on that day examined the throats of all of the children and ten were excluded for tonsillitis.

Bacteriological examination showed that two of them were diphtheria. It is reasonable to suppose that all of these children with their inflamed throats would have contracted diphtheria had they been exposed to the disease for a longer period. On Nov. 12th, two children were excluded from the Alger School and one of them was found to have diphtheria and again on Nov. 17, Dr. Fraser excluded Jeanette B. from the Berry School because he suspected diphtheria. A subsequent clinical and bacteriological examination confirmed the doctor's suspicion. On Nov. 23rd, Dr. Hills called me up and reported that George C. had returned to school after an absence of two days and the doctor gave it as his opinion that the boy had scarlet fever. The diagnosis was found to be correct and the boy was quarantined at home. These cases are only a few of the sixteen hundred children that have been excluded during the past year but I have cited them to emphasize the importance of this work. Detroit has had less contagious diseases during the past year than for some years previous and to any one who has studied our table of exclusions during that time, the cause must be very apparent.

As regards the examination of the eyes and ears of school children, this question is of equal importance with the exclusion of cases of contagious disease. Many a child has been considered stupid or backward when the trouble was, in fact, due to a physical defect which could be easily removed. School headaches and various nervous symptoms may be due to defective vision of which the child is unconscious. When the defects are slight a simple arrangement of seats may relieve the child's difficulty, and when this does not suffice, the oculist or aurist may be

relied upon to restore the normal vision or hearing and the obstacle under which the child has been laboring will be removed. Not only is attention on the part of the state to these matters desirable, but it is imperative. If the government makes it compulsory for a child to attend school it should look after the physical as well as the mental improvement of the individual whose charge it has undertaken. In Detroit we have made arrangements to add this phase of medical school inspection next year. The various teachers have been given instructions in the method of selecting pupils so that those who show any signs of physical defects may be carefully examined. Dr. Walter R. Parker has volunteered to look after this work and he will, with several assistants, make the examinations and keep such records as will be necessary to make the work valuable as the children pass from grade to grade.

The third purpose of medical inspection of schools, namely to note the growth and development of the children, will be conducted hand in hand with the eye and ear examinations. It is my intention to attend to this part of the work personally with Dr. Parker, keeping a proper card register of the child's measurements together with a record of a careful physical examination.

The examination of the air in school buildings was, I believe, first undertaken in Detroit. I do not know that many other cities have taken it up, but we believe that the results obtained have been very satisfactory. In January, 1902, this work was begun, upon recommendation of Commissioner Douglas, by the Sanitary Engineer and the Chemist of the Board of Health and a series of air examinations were made in thirty-five schools. In

speaking of the nature of the work done, Sanitary Engineer Raymond says in his annual report of that year:

"The past winter a series of tests were conducted by the chemist and myself to determine the quantity and quality of the ventilation of our public schools. The information sought was obtained as follows: The quantity of fresh air was determined by the computation from the dimensions of the air flues and air velocities as found by measurement and by anemometers. Many readings were taken to find the true average flow. Velocities vary continually from changing conditions in furnace heated buildings. This is true to some extent in the fan schools, as the velocity of the wind is felt under any system. In our modern plants provision is made to relieve some rooms and increase in others as occasion demands, maintaining a fairly uniform rate of flow. The quality was measured by two tests, one for the amount of moisture in the air and the other for carbon di-oxide, the latter being made by the chemist and described by him in his report. To find the amount of moisture a swing psychrometer and the psychrometric tables of the United States Weather Bureau were employed." Mr. Tibbals, in his report speaking of the determination of the amount of carbon dioxide in the air, says: "The determination of carbon dioxide is the best means we have of ascertaining the actual condition of the air in the school room, not because the carbon dioxide is the dangerous part of respired air, but because the quantity exhaled is believed to be directly proportional to the amount of certain poisonous substances of an unknown nature, given off in the breath, and subsequently is a comparative measure of these substances." Again he

adds: "The quantity of carbon dioxide in the outside air is always greater in cities and towns than in the country. A series of estimations made in Detroit gave results varying from 3.05 to 4.2 with an average of 3.54 parts in 10,000 parts of air. Authorities differ as to the quantity admissible in a school room, but most of the best sanitarians now require that it shall not exceed seven parts in 10,000."

Taking the results obtained in the tests above referred to, I carefully studied them and compared them with the contagious disease reports to determine, if possible, the relation existing between the two. It was found invariably that in the schools in which the amount of carbon dioxide in the air was high, i. e., above 9 parts in 10,000, the number of cases of communicable diseases was correspondingly large. Not only was this true, but I have determined further that when, for example, there were two schools in the same locality, the one in which the ventilation was poor, showed considerable sickness among its pupils, whereas in the other, the number of cases of communicable disease was comparatively small. I have in mind two schools in particular, both situated in the same locality only a short distance apart. The one, a public school, makes a showing of 6.1 parts of carbon-dioxide in 10,000 of air, while the other, a parochial school, shows 28 parts in 10,000. The former is a school from which we have but few cases of communicable disease, while the latter is one, the pupils of which are constantly on the sick list. Again I may mention one of the older public school buildings. An examination of this building last year showed 11.9 parts in 10,000. A study of the contagious disease reports show scarlet fever prevalent

in this school and recurrent in spite of thorough disinfection. As a result of these investigations, the Board of Health has established a standard of ventilation for schools, requiring that the air shall not contain more than nine parts of carbon dioxide in 10,000 of air. In a number of schools, the ventilation has been improved, and the one old public building above referred to has been condemned and will be replaced next fall by an entirely new one.

Another reform that is suggested by the examination of air in school buildings and by a study of the number of cases of illness found in poorly-ventilated schools is a shortening of the daily school sessions.

We have seen that in a number of instances the air in the school rooms undoubtedly contains the germs of specific diseases and the children confined in this atmosphere succumb to them. But is it not fair to surmise that a great many of the little ones would be spared even after this exposure if it were not continued too long? In other words, if they were not kept in these ill-ventilated rooms until all their powers of resistance had been used up but were allowed to go out into the fresh air, is it not probable that some of them would resist the infection? This is possibly a new argument in favor of shortening the school sessions but it is for that very reason that I present it. There are other and even better reasons why little tots ranging in ages from 7 to 12 should not be confined in school rooms for five or six hours a day, but a discussion of them at this time would lead us too far from the subject under consideration.

In conclusion let me say that the medical inspection of school children is well

received by parents and teachers. I have in my desk at the present time a number of letters from school principals, commending our work of last year and expressing the wish that it be continued. The physicians assure me that although they meet with objections from parents occasionally, it is the rule that the work meets with general approval and one of the most marked results that has been noticed by both teachers and medical examiners is the fact that parents have been taught to be more careful of their children. More attention is paid to the personal appearance and cleanliness of the child and also to its physical condition.

With so much good accomplished by a system of medical inspection whose prime object has been the restriction of communicable diseases, we can readily see and confidently predict that as the scope of the work is enlarged along the lines mapped out in this paper, the results obtained will be correspondingly gratifying.

Patent Urachus.—George Tully Vaughan (Washington, D. C.) gives a review of 52 cases of this rare condition and reports one of his own complicated with stones in both kidneys, which were successfully removed at two subsequent operations. He explains the defective development in the embryo which results in the formation of patent urachus and of Meckel's diverticulum. He mentions 4 kinds of patent urachus; the complete, the blind, the blind internal, and the blind external, and these may be congenital or acquired, some of the acquired varieties being caused by pressure of urine in the bladder opening Wutz's valve (a small valve which guards the bladder opening of the urachus) and allowing urine to enter the urachus. He thinks the best treatment is to dissect out the urachus, and sew or ligate the stump or opening in the bladder, after the manner of removing the vermiform appendix. A short space is given to tumors and cysts of the urachus. (*American Medicine*, October 14, 1905.)

OBSERVATIONS ON WOUND INFECTION FROM THE USE OF
ABSORBABLE ETAGE SUTURES.*SCHUYLER C. GRAVES,
Grand Rapids.

The object of the surgeon is to do his work as quickly as is convenient with safety and thoroughness; to inflict as little damage as possible upon the tissues; and to restore the parts as nearly as he can to the status quo.

Failure to recognize these points can mean the death of the patient or, on the other hand, post operative complications which constitute a perennial source of distress to the operator and may indirectly lead to a fatal tho' delayed termination.

An anaesthesia too prolonged, the infliction of too much trauma, can kill; while if we exclude the lethal element which certainly resides in many complications the result of faulty technique in assisting toward a *restitutio ad integrum*, the accomplishment of the latter in such fashion as to make the structural differences "ante" and "post" as small as is actually possible (for some differences must obtain) stamps the surgeon as one who not only—and first of all—looks after the future safety and comfort of his patient; but shows that he has manifested that grasp of the subject of surgery which permits him to view things from an artistic as well as a purely utilitarian standpoint. Surgery is an art as truly as a science and the artistic side should not be overlooked.

Intimately associated with both the utilitarian and the artistic elements in surgery is the matter of etage suturing. I may go farther and declare that, in

furtherance of this idea, etage sutures should, as a rule, be absorbable. It is ideal to bring tissues together with material which after the accomplishment of healing suffers harmless disintegration and absorption.

I am aware of the fact that a considerable number of operators continue the use of unabsorbable material in this way; but the number, I venture to say, is daily decreasing. In my opinion it is doing violence to the tissues to force permanently upon them articles in which resides a lurking and constant danger of irritation, infection, suppuration and final expulsion. This all means risk to the patient; risk of distress; risk of incapacity; risk of death.

I know it is claimed, and with reason too, that thoroughly boiled, or otherwise aseptic, articles, unabsorbable by nature, will maintain an undisturbed residence in the tissues, especially silver by reason of its germicidal quality; but all of us have noted failure after the use of silver as after the use of other unabsorbable stuff. Some claim that silk will absorb. I think I can say I have noted myself the absorption of buried silk; but I would change the form of the verb and state that it may or can (under certain circumstances) suffer absorption and not will.

But to the point, ideal suturing must be of the etage variety and must, in the main, consist of absorbable material.

Surgeons formerly prepared their own sutures (catgut); but there can be no real dispute over the fact that, outside of especial hospitals, the operator must look to the commercial house for his supply.

*Read before the Surgical Section of The Michigan State Medical Society at Petoskey, 1905, and approved for publication by the Council.

In the execution of the ideal technique outlined above the ugly fact has repeatedly forced itself upon me that something is still lacking. Something, at least, prevents me from securing the perfect results for which I strive. I get suppuration all too frequently.

It was for the purpose of analyzing deductions therefrom that this paper was undertaken. I have charted two series of cases, mostly celiotomies, in which wounds were closed by absorbable etage sutures; noting number, date, sex, type of

operation, hospital, variety and preparer of catgut used (catgut being practically the only absorbable material now employed by surgeons) and presence or absence of suppuration in healing. Naturally I have omitted septic cases from the start and also cases which died prior to the time required for pus to appear.

Series I comprises the cases operated during the year 1904 and Series II those operated during the first five months of the present year (1905). The number of cases in Series I is 35. The number in Series II, 19.

SERIES I.

NO.	DATE	SEX	OPERATION	HOSPITAL	PREPARER & VARIETY OF CATGUT	SUPPURAT'N
1	1- 6-04	Female	Hysterectomy (for fibroid)	Butterworth	Van Horn, chrom.	Absent
2	1-28-04	Female	Cholecystectomy	St. Mary's	Red Cross, plain	Absent
3	2- 2-04	Female	Liberation of Tubo-Ovarian adhes.	U. B. A.	J. Elwood Lee, plain and chrom.	Profuse and persistant
4	2- 4-04	Female	Herniotomy (Bassini's)	St. Mary's	Red Cross, plain	Moderate
5	2-13-04	Female	Hydro Salpinx (Intra-ligamentary Cyst)	U. B. A.	Elwood Lee, chrom.	Moderate
6	2-22-04	Female	Tubercular Peritonitis	U. B. A.	Elwood Lee, chrom.	Slight
7	3-31-04	Female	Retroflexion-Intra Abdominal shortening of Round Ligaments	U. B. A.	Elwood Lee, chrom.	Moderate but persistant
8	4-13-04	Female	Cystic Ovary	St. Mary's	Red Cross, plain and chrom.	Absent
9	4-18-04	Female	Appendectomy (Grid-iron op.)	U. B. A.	Elwood Lee, plain and chrom.	Absent
10	4-21-04	Female	Appendectomy (Grid-iron op.)	U. B. A.	Elwood Lee, plain and chrom.	Absent
11	6-23-04	Female	Appendectomy (Grid-iron op.)	Butterworth	Van Horn, plain and chrom.	Absent
12	6-28-04	Female	Appendectomy (Grid-iron op.)	U. B. A.	Elwood Lee, plain and chrom.	Absent
13	6-28-04	Female	Bilateral Intra-ligamentary Cysts.	U. B. A.	Elwood Lee, plain and chrom.	Profuse
14	6-28-04	Female	Umbilical Hernia	Butterworth	Red Cross, plain and chrom.	Very profuse
15	7- 1-04	Male	Bassini's	U. B. A.	Elwood Lee, plain and chrom.	Absent
16	7-25-04	Male	Bassini's	U. B. A.	Elwood Lee, plain and chrom.	Absent
17	8- 4-04	Female	Ventro Suspension	U. B. A.	Elwood Lee, plain and chrom.	Absent
18	8- 5-04	Male	Appendectomy	St. Mary's	Red Cross, plain and chrom.	Profuse
19	8-10-04	Female	Hysterectomy (for fibroid)	U. B. A.	Elwood Lee, plain and chrom.	Absent
20	8-25-04	Female	Ventro Suspension	U. B. A.	Elwood Lee, plain and chrom.	Absent
21	9- 6-04	Female	Bilateral Pyo Salpinx	U. B. A.	Elwood Lee, plain and chrom.	Moderate but persistant
22	9-14-04	Male	Bassini's	U. B. A.	Elwood Lee, plain and chrom.	Profuse
23	9-27-04	Female	Appendectomy (Grid-iron op.)	U. B. A.	Elwood Lee, plain and chrom.	Absent

NO.	DATE	SEX	OPERATION	HOSPITAL	PREPARER & VARIETY OF CATGUT	SUPPURAT'N
24	10-18-04	Female	Double Salpingo-Oöphorectomy	Butterworth	Van Horn, plain and chrom.	Absent
25	10-25-04	Female	Appendectomy (Grid-iron op.)	U. B. A.	Elwood Lee, plain and chrom.	Absent
26	11- 3-04	Female	Bassini's	U. B. A.	Elwood Lee, plain and chrom.	Very profuse and persistant
27	11-11-04	Female	Oöphorectomy and partial resect. of tube	U. B. A.	Elwood Lee, plain and chrom.	Moderate
28	11-12-04	Female	Unilateral Salpingo-Oöphorectomy	St. Mary's	Red Cross	Moderate
29	11-24-04	Female	Ovarian Dermoid and partial resection of tube and ovary	Butterworth	Van Horn, plain and chrom.	Moderate
30	11-26-04	Female	Double Salpingo-Oöphorectomy	Sanitarium, Charlotte, Mich.	Van Horn, plain and chrom.	Absent
31	11-30-04	Male	Suprapubic lithotomy	U. B. A.	Elwood Lee	Profuse
32	12- 6-04	Female	Cholecystostomy	Butterworth	Van Horn	Absent
33	12- 7-04	Female	Ventro Suspension	U. B. A.	Elwood Lee, plain and chrom.	Exceedingly profuse
34	12-13-04	Female	Dermoid Cyst, Double Salpingo Oöphorectomy and Ventro Suspension	U. B. A.	Elwood Lee, plain and chrom.	Slight
35	12-31-04	Female	Ventro Suspension (Gill.) Breast Adenoma (Excision)	U. B. A.	Van Horn, Samson & Sock	Slight Moderate

SERIES II.

NO.	DATE	SEX	OPERATION	HOSPITAL	PREPARER & VARIETY OF CATGUT	SUPPURAT'N
1	1-25-05	Female	Cholecystostomy	U. B. A.	Elwood Lee, chrom.	Absent
2	1-28-05	Female	Ovariectomy	St. Mary's	Red Cross, plain subcuticular, other 2 wormgut	Absent
3	2-16-05	Female	Multiple Uterine Myomectomy	St. Mary's	Van Horn, chrom.	Absent
4	2-23-05	Female	Ventro Suspension (Gilliam)	U. B. A.	Samson & Smith, plain	Slight oozing sero-pus
5	2-23-05	Female	Appendectomy (Grid-iron)	U. B. A.	Samson & Smith, plain	Slight
6	3- 9-05	Female	Append. and liberation of bowel adhesions	U. B. A.	Van Horn, plain and chromicized	Quite free and persistant
7	3-11-05	Female	Ventro Suspension (Gilliam)	U. B. A.	Elwood Lee, plain	Absent
8	4- 8-05	Male	Cholecystostomy	Butterworth	Van Horn, chrom.	Absent
9	4-13-05	Female	Ventro Suspension (Mod. Gilliam)	U. B. A.	Van Horn, chrom.	Absent
10	4-16-05	Male	Herniotomy (Bassini)	Butterworth	Van Horn, chrom.	Absent
11	4-24-05	Female	Ventro Suspension (Mod. Gilliam)	U. B. A.	Elwood Lee, formalin	Slight
12	4-27-05	Female	Double Salpingo-Oöphorectomy	Hastings, Mich.	Elwood Lee, chrom.	Slight oozing of serum
13	5- 3-05	Female	Ventro Suspension (Mod. Gilliam)	St. Mary's	J. & J., plain and chrom.	Slight
14	5- 3-05	Female	Colo-colostomy	U. B. A.	Elwood Lee, form.	Slight
15	5- 9-05	Female	Double Salpingo-Oöphorectomy	Butterworth	Van Horn, chrom. wormgut subcutic.	Absent
16	5-10-05	Female	Removal of broad lig. Sarco. Cyst.	Butterworth	Van Horn, chrom. wormgut subcutic.	Absent
17	5-15-05	Female	Ventro Suspension (Mod. Gilliam)	U. B. A.	Elwood Lee, chrom. and plain wormgut subcutic.	Slight
18	5-16-05	Female	Appendectomy	U. B. A.	Elwood Lee, chrom. and plain wormgut subcutic.	Absent
19	5-31-05	Female	Double Salpingo-Oöphorectomy	Charlotte San.	Elwood Lee, form.	Absent

TOTAL NUMBER OF CASES, 54
PERCENTAGES CONCERNING ASEPSIS AND INFECTION.

J. Elwood Lee.....	22 cases=61 % of 1st series.	10 aseptic=45 %.....	12 inf't 55 %
Van Horn.....	7 cases=19 % of 1st series.	5 aseptic=71 %.....	2 inf't 29 %
Red Cross	6 cases=17 % of 1st series.	2 aseptic=33½ %.....	4 inf't 66½ %
S. & S.....	1 case = 3 % of 1st series.		1 inf't 100 %
J. Elwood Lee.....	8 cases=42 % of 2d series.	4 aseptic=50 %.....	4 inf't 50 %
Van Horn.....	7 cases=37 % of 2d series.	6 aseptic=86 %.....	1 inf't 14 %
Red Cross	2 cases=10½ % of 2d series.	1 aseptic=50 %.....	1 inf't 50 %
S. & S.....	2 cases=10½ % of 2d series.		2 inf't 100 %

As a result of the foregoing analysis one cannot but believe that there are marked differences in the asepticity of the various preparations of catgut furnished the surgeon by commercial houses.

While all varieties may at times show defective strands or even defective consignments (St. Mary's herniotomy) it is hardly necessary to add that the variety which is associated with the least evidence of infection is the one to select, although improvement, I grant, is quite possible after the consignment by any house of inferior gut; but we should remember in this connection that suppuration is not always the fault of the gut.

It is unquestionably true that really infected catgut may not cause suppuration by reason of the fact that leucocytosis and phagocytosis prove sufficient to destroy the bacteria. On the other hand, as stated above, catgut or any absorbable suture or ligature material undoubtedly sterile may be found associated with suppuration through faulty technique.

In the placing of absorbable, etage sutures there are five points of value which tho' axiomatic are nevertheless, from carelessness or other reason, often overlooked. These are: 1. The exercise of great care to prevent the contamination of the gut on its way from package to patient. Personally, unless a nurse is exceptionally in my confidence, my assistant does the threading. In this way preliminary contact is reduced to two factors, assistant and surgeon.

2. The use of sterile, preferably rubber, gloves. The latter articles have evolved from the thin, smooth variety to the thin, pebbled type, and then to the rather coarse, heavy glove used by the most advanced surgeons to-day. Rubber gloves should suffer no punctures as the perspiration stimulated and retained by the impervious material must of necessity contain bacteria from the dermal glands not accessible previously to the scrubbing brush. Punctures should be immediately covered by cots (a supply of which [aseptic] should always be on hand) or fresh gloves put on. 3. The substitution of the running for the interrupted suture. By doing this we eliminate as much as possible the knot which certainly, in its more pronounced resistance to absorption and its tendency toward local irritation, favors suppuration. In this connection it may be stated that the question of the knot and the style of suture is not unimportant. A knot loosely tied or tied only twice is apt to fail us because of the untying made possible by strain and the softening effect of the body juices. My own plan is to tie a knot fairly tight and three times instead of two. Fancy or complicated sutures after the fashion of the figure eight, the mattress, the quilted and others should be avoided, generally speaking, in buried work, for as Moynihan says, "The simplest way a thing can be done in surgery is the best way." A plain over and over, running right-angled suture cannot, in general situations, be improved upon.

4. Tissues to be approximated should be merely brought together and not choked or jugulated, and this gentle approximation should be maintained until healing has occurred. Material for accomplishing this result should be firm, resistant to speedy absorption and inelastic, all three qualities being important in suture material. Some form of chromicized or formalin gut is generally best. Of course this applies more especially to the reunion of structures which are important and which also require some time for solid healing.

5. Reinforcement of the suture scheme by strips of adhesive plaster.

It is my practice to maintain exact approximation of the tegumentary edges by placing narrow strips of aseptic ZNo. plaster over the line of subcuticular suturing; then to dust wound with some antiseptic powder, preferably sulfodine, of which I cannot speak too highly; then to put a thick, narrow strip of gauze directly on wound held securely by two or more broad bands of rubber adhesive plaster. Finally, of course, more gauze and the binder. In this way the tension on the sutures is taken off and the strain incident to vomiting much neutralized.

It will be noticed that in my later cases there has been less pus than in the earlier ones. This is due no doubt to greater care in technique: but in my opinion two other factors share in the result.

The first of these is the variety of gut used. The formalin material put up wet in breakable glass tubes I believe to be irreproachable. Gut acted upon by formalin is not so irritating to the tissues as is chromicized gut because it is not so stiff or rigid. It also while resisting absorption resists for not too long a time.

The other factor is the substitution of a shotted, wormgut strand for the subcuticular catgut suture, thus avoiding the transportation of dermal germs to the deeper structures and at the same time furnishing them with pabulum in the rich, juicy suture employed.

The wormgut etage in toto properly placed will not develop suppuration; but this style of sustaining tissues is not a safe one. If put in with the right-angled stitch or even with a short "whipping" stitch it is withdrawn with difficulty, sometimes necessitating an incision to liberate it, while if put in with long oblique stitches in order to insure easy removal subsequently spaces or gaps are formed which, especially in presence of vomiting, invite post operative griefs better avoided for the sake of all concerned. These loose spaces in the aponeurosis conduce toward subsequent ventral hernia while that most insidious complication, properitoneal hernia, (where bowel and not omentum forms the protruding mass) threatens the case with lively danger where such ineffective suturing of the edges of the peritoneum has been done.

The fact that properitoneal hernia presents, as a rule, no mass at site of incision adds not a little to the danger associated with the occurrence. (St. Mary's case.)

It need scarcely be said that the through and through suture of wormgut, silk or silver, (or their etage use, for that matter) as noted elsewhere, in part, while usually unassociated with suppuration, is to-day quite passe except in cases demanding urgency in closure. Through and through sutures do not accurately coapt the tissue-planes and are followed by a larger percentage of post operative herniae than are those of the absorbable

etage nature, even when the latter are associated with moderate wound infection.

Suturing etage with catgut is not devoid of danger, the strands under great strain occasionally giving way and thus, in case recovery ensues, demanding the institution of procedures for the prevention or cure of the expected ventral hernia. (Tensile strength.)

The practical question involved in this discussion, viz.—The proper, and that, of course, includes aseptic, closure of inci-

ions or wounds which have divided more than one tissue-stratum is interesting and important. I may sum it up, as large as it is, in a single statement. Eternal vigilance in the selection of the suture material and in the proper placing of the same. Even this will not produce ideal results because some patients presenting the double non desideratum of lowered cellular resistance and bacterial colonization in the blood-tide will develop suppuration; but having done our duty criticism must fall short of us.

DIAGNOSIS AND TREATMENT OF EMPYEMA OF THE CHEST.*

A. J. LAWBAUGH,
Calumet.

The term empyema is used in this paper to designate a purulent exudate within the pleural cavity. Inasmuch as this condition consists of a collection of pus confined in a closed cavity under pressure and attended by symptoms due to the absorption of toxic material it is, so far as therapeutic considerations are concerned, practically a pleural abscess. It is, therefore, essentially a surgical disease. While purely serous or fibrino-serous forms of pleurisy may be treated by internal medication with or without simple thoracentesis purulent or fibrino-purulent pleuritis must receive more radical surgical attention.

Diagnosis.—The determination of the character of the exudate is the first and most important step in the treatment of pleuritis. No operative procedure should be undertaken until the exact nature of the fluid has been ascertained. Auscultation and percussion will demon-

strate the presence of fluid within the pleural cavity and the effects of pressure upon the heart and lungs, but these methods will not reveal the character of the fluid. The occurrence of fever and emaciation may lead to the suspicion of an intoxication arising from the absorption of septic products, but these symptoms in themselves are not conclusive. While in some cases the purulent nature of the fluid may be revealed by its spontaneous rupture and escape, this is an event to be deplored, and to be avoided by early diagnosis and proper treatment. It follows, therefore, that the character of the exudate can be determined and an exact surgical diagnosis made only by means of an exploratory puncture (paracentesis thoracis or thoracentesis). An exploratory puncture is attended by so little risk and pain that its employment as a diagnostic resource should never be neglected, as it not only demonstrates the presence of a purulent exudate but also the exact position of the pus-collection. Thoracentesis,

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therefore, should always be employed in the diagnosis of the exudate forms of pleuritis as it makes an uncertainty a positive fact. Further, thoracentesis may be used not only as a diagnostic, but also as a palliative or curative measure.

The statement is usually made that thoracentesis is a perfectly safe procedure if carefully done, but Dr. Russell Fowler of Brooklyn has reported one case with fatal termination. In this case the needle was carefully introduced, but before the piston of the syringe had been drawn up the patient gave a gasp and was dead. The heart was reported by the pathologist to be in a normal condition. In a second case observed by Dr. Fowler the patient immediately after the introduction of the needle began to cough up small quantities of blood and blood was withdrawn by the syringe. The patient at once collapsed, but under vigorous stimulation rallied. In my own practice I have myself practiced thoracentesis and have seen it used many times, and have never observed the slightest harmful result. The citation of the foregoing cases should not deter us from the employment of so valuable an aid in the diagnosis of this condition.

Method.—The best instrument for thoracentesis is the one known as the pocket aspirator, having a needle three inches long and of sufficient calibre to permit the passage of a thick fluid. The ordinary hypodermic syringe is too small because the lumen of the needle will not allow the passage of thick pus, and the needle is so short that it will often fail to reach the exudate, and is so slender that it may be broken off should the patient move suddenly or if much force be used to enter the cavity. The exploration should always be made under careful

aseptic or antiseptic precautions; the skin should be sterilized in the usual way and the needle should be boiled. Should the collection of purulent exudate be very small two or three punctures may have to be made before it is found. The use of an anesthetic is usually not necessary in thoracentesis; when desired a few drops of one-half per cent. solution of cocaine may be injected or the point of a puncture may be frozen by some one of the various freezing methods. When the needle is withdrawn the skin puncture may be dressed with either a collodion dressing or a strip of sterile adhesive plaster.

Not only are the location and character of the exudate shown by means of thoracentesis, but we are by its aid enabled to form some idea of the extent and severity of the process, and also to gain some data for the prognosis. A thin fluid containing slender threads of fibrin, with slight or no order points toward a pneumococcus infection, particularly if there has been a preceding pneumonia. In tuberculosis cases the fluid is thin and contains many whitish shreds of fibrin. The microscopical examination of the fluid may also aid in the diagnosis of the etiological agent and in prognosis. Cover-glass smears may be made and stained for bacteria. The pneumococcus cases are much more amenable to treatment and progress more rapidly toward recovery than do those caused by the streptococcus or the tubercle bacillus. The tuberculous cases are the most unfavorable.

Thoracentesis may prove curative in exceptional cases. In the case of pneumococcus infections, particularly in children, a thorough evacuation of the exudate may result in a cure. Several cases of typhoid empyema have been reported cured after a thorough withdrawal of the

fluid; but it should be remembered in this connection that several cases of this kind have also been reported as having recovered spontaneously, the pus having been absorbed. At present, therefore, thoracentesis must be regarded as a diagnostic and palliative measure rather than as a curative one.

As a palliative procedure, thoracentesis may be employed in cases in which the intrapleural tension is extreme. Such cases should be aspirated without delay. As a procedure preparatory to the use of more radical measures thoracentesis is also very highly spoken of by Professor N. Senn. Aspiration should always be performed in the case of septic and very weak patients. The amount of fluid withdrawn should depend upon the condition of the patient. It is not necessary to withdraw the entire amount of fluid at one sitting. Thoracentesis improves the desperate cases so much that with the addition of stimulation the condition of the patient may be so much bettered that a more radical operation may be undertaken with much less risk than would otherwise have been the case. Anaesthesia will be much better borne after the intrapleural tension has been lessened by thoracentesis. The latter operation should be performed some hours before the radical one.

In the average case of empyema more radical measures than simple thoracentesis will have to be carried out. To the surgeon there is offered the choice of several different methods for opening and draining the pleural cavity: thoracotomy or pleurotomy with or without resection of one or more ribs. Estlander's operation, Schede's thoracoplasty, Delorme's decortication, etc. The general principles involved in each one of these methods are essentially the same.

Preparation of the Patient.—The patient must be carefully prepared for the operation. Empyema cases are as a rule much debilitated by septic absorption; and all unnecessary shock and exposure must be carefully avoided. It is best to prepare the patient in bed, and to disinfect only that portion of the chest which lies in the field of operation. Care should be taken that the disinfecting fluids do not wet any part of the patient save the area of operation. In the case of very weak patients the whole body with the exception of the field of operation should be warmly covered. When possible the patient should lie on a hot water operative cushion. I strongly recommend the method of disinfecting the area of operation as suggested by Professor McBurney, thus doing away with scrubbing and the use of much disinfecting fluid.

Anaesthesia.—The question of anaesthesia should next be considered. The need of an anaesthetic and the choice of the most suitable one must be determined in each individual case according to the conditions. The condition of the patient and the operative procedure used are the most important points to be considered. As mentioned above thoracentesis rarely requires the use of an anaesthetic, and then only a local one. In the case of a pleurotomy with resection of one or more ribs general anaesthesia will be necessary. The condition of the heart-muscle must be carefully considered as well as that of the lungs. Chloroform has generally been preferred, although some authorities of note consider the use of ether as imperative. In a few cases of pleurotomy with resection of several ribs performed by Dr. G. R. Fowler, complete analgesia was obtained by spinal cocainization, but this method requires an experienced hand,

and we are as yet in ignorance as to what dangers may be encountered.

Dr. Da Costa states that local anaesthesia in pleurotomy is very satisfactory in the case of adults, but much less so in the case of children. Dr. S. S. Fowler relies entirely on local anaesthesia for simple pleurotomy in both adults and children. He states that children suffering from empyema are apathetic and while they make an outcry at the first cut of the knife they are too weak to offer active resistance. It is true that these weak patients should not be exposed to the least possible risk of shock, but I also deprecate the giving of any unnecessary pain, and prefer to act on the advice of Dr. Da Costa, using a little ether cautiously and performing first a simple pleurotomy and then a few days later making a resection to afford proper drainage.

Position of Patient.—The position of the patient is a very essential point. It will depend upon the operative procedure employed, but it is essential, however, that the patient rest as little as possible on the sound side as this embarrasses respiration. Further, the patient should not be left to support himself in the required position, but all parts of the body should be at rest and all muscular strain relieved. This may be accomplished by means of soft pillows or other supporting material. In the case of the simpler operations the patient may be laid flat on his back with his affected side extended somewhat beyond the edge of the table. The arms should be placed over the head. In the case of more extensive operations it may be necessary to turn the patient so that he rests upon his sound side, but even in these cases much can be done with the patient in the dorsal position and the side projecting over the edge of the

table. Should it become necessary to turn the patient on his side great care must be exercised, since the pressure of the fluid may suddenly embarrass the heart and cause death.

Incision.—It is not necessary to reach the very bottom of the cavity in making the incision for an empyema, for what is the bottom of the cavity on the day of operation is the next day pushed up by the action of the diaphragm.

Resection of Ribs.—Koenig of Germany and Dr. Stone of New Orleans many years ago persistently urged the necessity of the resection of one or more ribs as an essential part of every radical operation for empyema. Resection does not increase the immediate risk of the operation to any extent, and the advantages gained from it in securing free and permanent drainage more than outweigh any additional dangers incident to the operation. Professor Ingalls of Chicago is very much opposed to rib resection on the ground of danger of necrosis of the exposed rib ends. He uses a flat trocar and canula, and after puncturing the chest wall withdraws the trocar and introduces through the canula two rubber tubes for drainage, claiming that this method is very efficient.

In the absence of contra-indications the incision is made in the axillary line at a point corresponding to the lowest level of the empyema cavity. It is interesting to note that every intercostal space, from first to last, has at different times been recommended as the best point of attack in the operation for empyema. The best results may be expected when the pleurotomy is performed at the level of the sixth rib. Not less than two inches should be resected, so that opening sufficiently large to admit the finger may be made,

in case such a procedure becomes necessary. Various forms of incision are employed to expose the rib, curved, straight, etc., but in any case it should be ample. The rib having been exposed by the incision, the periosteal envelop with the tissues attached over it is then separated from the rib by means of an elevator, care being taken to lift out from its groove at lower border of the rib the intercostal artery with the tissue to be reflected. To accomplish this result satisfactorily the operator must hug the bone closely.

After the rib has been exposed the bone is lifted forward with an elevator and excised with a strong pair of bone-forceps. All that remains to be done after the rib resection is an incision with the scalpel in the centre of the periosteal trough large enough to admit the index finger. The evacuation of the pleural sac should always be done slowly; this can be accomplished most effectually by interrupting the flow of pus from time to time by plugging the pleural incision with the finger or by a pledget of gauze. Rapid evacuation should be avoided to prevent a too rapid vascularization of the affected lung and the pleural adhesions and granulations; otherwise a troublesome haemorrhage might be produced. After the pus has escaped from the cavity a finger may be introduced and some of the masses of exudate loosened and withdrawn. This manipulation should be carried out with the utmost delicacy. I have never employed this procedure myself, as it is not absolutely necessary and might be dangerous. The individual operator must decide this question for himself. It is probable that a lung which is attached by adhesions dense and firm enough to require tearing with the finger will ultimately require other measures to free it. I

have packed the cavity with gauze which on its removal brought away masses of exudate which would have taken some time to soften and drain away. The use of the finger is fraught with danger unless managed in the most gentle manner.

Irrigation.—The question as to whether the cavity should be washed out is also one that must be left to the judgment of the individual operator. I, myself, have never used and do not advise the irrigation of an empyema cavity. Sudden deaths have been reported as the result of irrigation and the procedure is absolutely unnecessary except in those cases in which the pus is very foul. Even in these cases it should be rarely carried out and then with the utmost delicacy of manipulation. Even with such precautions shock has resulted. Da Costa quotes Willens as maintaining that cases in which lavage is not used recover sooner than those in which it is. One author recommends the immersion of the patient in a salt bath, the solution being allowed to flow out and in while the patient is breathing, the opening of the wound being under the surface of the fluid.

Drainage.—It is assumed that the operation has emptied the pleural cavity as completely as possible of pus and masses of fibrinous exudate. In very recent cases occurring in children in which the lung completely expands at the time or soon after the operation the simple packing the wound with gauze may alone be sufficient. Such cases, are, however, extremely rare. In the great majority of cases it will be necessary to employ a rubber drainage tube or tubes. There are many ways of arranging this tube. It may be slender, fenestrated, curved on itself, etc.; the coils are held together by thick strands of catgut so that a mat is

formed which rests on the floor of the cavity, the proximal end of the tube emerging from the opening. On the other hand a short, thick-walled tube of a large calibre may be used, and this has my preference. Such a tube serves to preserve an opening in the chest and affords a way for the secretions to escape more readily. Various other ways of placing the tube are employed. Care must be taken that the tube does not press upon the lung or injury may be the result. The tube may be retained in place by means of a safety-pin through its walls but not through the lumen, close to the chest wall. A piece of tape is then passed through the pin and fastened around the chest. An efficient method which has been used by myself and my colleagues is the passing of one end of the tube through the centre of a square of rubber sheeting and stitching the end to the latter. Several layers of gauze are interposed between the rubber square and chest wall to prevent any excoriation. Abundant dressings should be used over and around the tube and fastened in place by a chest binder.

It has been advised that the tube should project for some distance outside of the chest wall and be attached to a longer tube whose distal end is submerged in a basin or bottle of a solution of mercuric chloride placed by the bedside. The respiratory movements of the affected lung or of its fellow will cause the solution to rise and fall in the tube, and this will aid the pus to flow down into the solution. The cavity will thus be kept drained and the chest wall and dressings clean. The thoracic wound will therefore close the more readily around the tube. This may be an ideal method, but I am satisfied that it would

be a difficult matter to carry out efficiently unless the constant care and attention of an attendant could be obtained, as the apparatus would be easily displaced by the movements of the patient. I have not employed this form of drainage, having been satisfied with the good results of the simpler method. The dressings, of course, must be changed as frequently as may be necessary to preserve cleanliness.

Position of the Patient After Operation.—Patients should not be allowed to sit up for several days after the operation; indeed they should resume the sitting posture by degrees. As a rule they are emaciated by long illness. Their respiratory and circulatory systems have experienced a severe shock, and a sudden change of position may be productive of severe and even fatal syncope. The patient should be encouraged to lie on the affected side as much as possible, and to assume such position as will provide most efficient drainage in order to prevent the stagnation of the secretions.

Significance of Fever.—A rise in temperature if occurring early, in the first forty-eight hours following the operation may be due to a supervening pneumonia or to the extention of a latent or subsiding pneumonia. Such complications would be revealed by the history of the case. In the case of a prior pulmonary tuberculosis an acute process may be engrafted on the chronic one. The most common cause of fever, however, is to be sought in the stagnation of the secretions. This is to be avoided according to the directions given above. In the case of pus too thick to flow through the tube it may be necessary to employ irrigation, or what is preferable to use a tube of larger calibre. An empyema should be kept as fresh and clean as we should keep an abscess occurring else-

where. A well-placed drain of suitable calibre and a favorable position of the patient will usually accomplish this. Should every other device fail then irrigation may be carefully employed, but I do not advise it, as I do not think it positively essential. In case several pus-sacs or cavities are present these should be converted into one cavity; but this occurs so rarely that need scarcely be mentioned. When drainage is properly provided for, and if no complications such as pneumonia occur, and if the case is not tuberculous the temperature will soon reach normal.

Shock.—Shock is to be looked for in all and combated by the usual methods. The amount of shock will depend upon the previous condition of the patient and the acuteness of the process, and also somewhat upon the rapidity with which the cavity is emptied.

Haemorrhage.—Haemorrhage may occur from the non-ligation or the improper ligation of the intercostal artery, rarely from the cavity itself, unless extensive adhesions have been disturbed by manipulation or by the too rapid emptying of the cavity. In the first contingency the bleeding vessel must be sought for and ligated. In the latter, if excessive, there must be a temporary packing and closure of the opening in the chest by securely strapping a compress over the opening.

Lung Gymnastics.—Some authorities recommend the use of the water bottle as an aid in the expansion of the lung, but I have found the full inspiration and expiration by the patient just as efficient. This gymnastic expansion must not be neglected, otherwise the adhesions may become firm and dense. The patient should be gotten out of bed and into the

open air as soon as able to be about with safety.

Duration of Healing.—In acute cases the lung expands readily and the cavity quickly closes. The younger the patient the quicker the recovery; and on the other hand the longer the duration of the empyema the greater will be the length of time for the closure of the cavity. In cases of long standing as well as tuberculous cases an extremely long after-course is to be expected. In these cases other means of obliterating the cavity must be considered.

Complications.—Secondary Scoliosis.—As a result of the approximation of the ribs of the affected side by reason of the failure of the muscular apparatus of that side to take part in the respiratory act the dorsal portion of the spine becomes scoliosed with the concavity of the deformity toward the affected side. Compensatory curves in the cervical and dorsal regions will follow sooner or later. These deformities will disappear to some extent in those cases in which the lung again expands.

Fistula.—This complication is frequently met with in those cases in which diligent endeavors have been used to obtain efficient drainage, proper lung expansion, etc., also in tuberculous cases, and in those in which the empyema has existed for a long time with formation of many adhesions. As a rule the persistence of a fistula for two or three months after the operation demands investigation as to its cause. This may be necrosis of the ribs; or proper examination of the patient may reveal the existence of tuberculosis. In the treatment of persisting fistula several courses are open to us.

1st.—The Estlander operation consisting of a multiple resection of several or as

many ribs as may be necessary to cause the chest wall to sink in over the cavity where pus is still secreted.

2nd.—The Schede operation may be selected as an alternative when the Estlander has not produced or does not offer the desired result. Schede's thoracoplastastic operation is a grave one, and should never be undertaken without clear and well-defined indications. It is attended by a degree of shock equivalent to that of a major operation. In well-selected cases it has yielded encouraging results. Fowler of Brooklyn practises resection of the pulmonary pleura in connection with the Schede operation, claiming that the resection is a very important part of the combined operation. These operative measures should not be resorted to until it is seen that the cavity will not close by Nature's aid alone. Such cavities tend to close spontaneously through the expansion of the lung on the diseased side, by the increased rise of the diaphragm on that side and by narrowing of the intercostal spaces through the gradual encroachment of the ribs. The latter may finally even overlap.

Delorm's method of "decortication" of the lung may be used in very chronic cases; this consists of the reflection of a flap of skin muscle and bone, and then the removal of both pleural surfaces either with the finger or scissors. This operation is still in the experimental stage, but a number of cures have been reported as the result of its employment. It is attended by the danger of severe haemorrhage.

Prognosis.—Not all cases can be cured even by extensive operation and in obstinate cases several operations may be necessary. Such cases offer unfavorable subjects for operation because of the long period of suppuration and the possible tuberculous infection. Premature removal of the drain is often followed by relapse. Drainage must not be suspended until careful examination has shown satisfactorily that the suppurating pleural cavity has been obliterated. It must be remembered that in this condition we have to deal with a suppurating cavity; and the same results of treatment apply here as in similar conditions in other parts of the body: viz., thorough and efficient drainage.

THE VALUE OF EARLY DIAGNOSIS IN ULCERATIONS OF THE ANO-RECTAL REGION.*

L. J. HIRSCHMAN,
Detroit.

Believing that many patients can be saved untold suffering and not a few saved from certain death by a better understanding of the value of early diagnosis of affections of the ano-rectal region, the author has endeavored to bring

out a few points of more or less importance and interest in regard to ulcerative conditions of this region.

A great many reflex symptoms which are manifest in remote parts of the body may be traced to ulcerations apparently simply located within the confines of the rectum, and many a man's life has been

*Read at the Annual Meeting of The Michigan State Medical Society, 1905, at Petoskey.

made miserable by the existence (unnoticed) of a small fissure in ano.

The author will not spend much time in the consideration of ulcerations which are situated outside of the sphincter, because these ulcerations are noticed first by the patient himself and their recognition is a very simple matter. Moreover, these ulcerations which are really extra-anal or perineal, are not as a rule accompanied by any other than the symptoms of local disturbance. The high up ulcerations situated in the rectum and the irritable, often intolerable ulcerations and fissures situated within the grasp of the sphincter are of more interest and vastly more importance; because of the length of time which frequently intervenes between their origin and their recognition by the practitioner.

The significance of blood in the stool is of the greatest importance. A great many patients notice a little blood in the stool, or perhaps notice a few drops on the toilet paper after a passage, and think very little of it because there are no other symptoms. They may casually mention the fact that they are suffering from an attack of "piles," that they have noticed a few drops of blood on the toilet paper; they may perhaps go to the corner drug store and get one of the many vaunted pile cures, and then after six months or a year, or longer, find that they are still losing blood and that these "sure cures" have not relieved them.

A most distressing picture is presented not infrequently when the rectum of one of these patients is examined for the first time and strictural ulceration, tuberculosis of the rectum or a malignant growth well advanced, is discovered.

The appearance of blood of a fresh bright red type is always indicative of

ulceration of some portion of the ano-rectal-sigmoidal canal. Ulcerations higher up give rise to hemorrhage which is of a dark brownish, coffee-ground or tarry appearance. The blood from ulcerations higher up is mixed with the stool and is a component part of the stool, or even composes the stool, but hemorrhage from the lower portion of the bowel, namely the sigmoidal colon, the rectum and the anus, is free, either precedes, accompanies or follows the fecal mass. Its bright red may or may not be clotted; it may be considerable, it may be a mere streak in the stool, or it may consist of a few drops after a defecation is completed and is noticed first by the patient upon the toilet paper.

The history of rectal hemorrhage, however slight, should call for an immediate thorough examination of the whole rectal cavity. Ocular examination first of the anus, then proctoscopic examination of the rectum and sigmoid with the rectum well dilated and with the proper light should follow. The following cases will illustrate the importance of early examination in cases which give practically no other history than that of hemorrhage:

Miss M. H., age 38, Detroit, was referred to the writer by Dr. Breisacher April 4, 1905. Patient states that she was in perfect health until two or three months previously, when she noticed that her passages became more difficult, that she could not pass them except in a half standing position and that the stools were accompanied by blood. Stomach became irritable and food was not digested properly. The physician whom she consulted gave her various prescriptions for "stomach trouble," but she grew no better quite fast. Thinking that she had stomach trouble she consulted a gastro-enterolo-

gist, who, upon inquiry, soon elicited the fact that she must be suffering from some form of rectal ulceration, and the case was referred to the writer.

Examination showed a very tight sphincter fissured in its posterior portion with a sentinel pile guarding the fissure. Proctoscopic examination showed a strictural ulcer three inches from the external sphincter which was so tight that even under anesthesia the tip of the forefinger could not be admitted. The stricture was surrounded by a dense infiltrated mass and bled very freely upon touch. On April 5, an inguinal cholestomy was done and the bowel moved through a new opening until April 25, when the whole mass was removed by the perineal route. The rectum with the stricture intact was removed and sent to the Detroit Clinical Laboratory for examination. Report showed it to be a carcinoma. When the rectum was removed the healthy portion above the growth, or the lower portion of the sigmoid, was brought down to the mucous membrane of the sphincter and united to it with chromicized cat-gut. A new rectum was thus formed. On May 9, the inguinal anus was closed under sterile water infiltration anesthesia and the patient was discharged May 30, having good movements through her new rectum and having gained 23 pounds in weight; digestion and defecation seemingly as good as ever. This case illustrates how far a malignant growth in the rectum can proceed without any pain and with hemorrhage as the principal symptom.

William D. D. marine engineer, age 34, was referred by his brother, a physician in a neighboring town, on April 14, 1905. This man apparently was in perfect health and weighed 195 pounds. He presented

a history of perfect health up to one and one-half years previous to the time he consulted me, when he noticed after his passages a pulsating pain and a sense of fullness and heat in the rectum. After he commenced to notice blood streaks on the stool, had inclination to go to stool about every two hours. Noticed stools were tape like or ribbon shaped. Said that he could move his bowels more comfortably when in a half standing position. Sometimes hemorrhage quite profuse, but no pain and no other symptoms.

His examination showed buttocks reddened and a folliculitis around the hair roots. Proctoscopic examination showed a tubular ulcer three inches from the anus. This ulcer had contracted, so that the stricture which resulted would not admit the fore-finger.

On April 20th patient was operated at Harper Hospital. The lower three inches of the rectum was amputated through the perineal route, and the patient made an uninterrupted recovery and was discharged from the hospital at the end of five weeks. He now has good movements every day without cathartic assistance. There remained a little irritable spot at the mucocutaneous juncture, which responded readily, however, to local treatment, and he is back at his work, has regained his weight and is perfectly healthy at the present time. This man never consulted a physician until a few days before he was examined by the author, and then he casually mentioned the fact to his brother, who is a physician, that he was passing blood from the stool. His brother insisted upon his coming to Detroit and being examined. He acknowledged that he had been using some of the various pile cures for over a year past. Examination of the

mass removed showed that it was a non-malignant inflammatory stricture. Both of the above named cases if seen early would have yielded to local treatment readily without the major operation necessitated by the condition when seen by the writer.

Another very important symptom which would lead me to examine for ulcer in the rectum is a persistent recurrence of diarrhoea, particularly morning diarrhoea. The patient who, shortly after arising in the morning, has two or three or four soft movements, accompanied by blood or not, perhaps several inclinations to go to stool, with or without result, later in the day, but is not disturbed at night; should have the rectum thoroughly explored. Very often a high up ulcer from two to four inches from the anus will be found, and the cure of this will bring about a relief of the troublesome diarrhoea.

Mrs. E. McB., school teacher, age 32, referred by Dr. Wright, of Detroit. History of tenesmus and diarrhoea, particularly morning diarrhoea dating from pregnancy of seven years ago. Diarrhoea only occasionally accompanied by blood. Examined on Oct. 30, 1904, when two ulcers about one-third to three-quarters of an inch respectively in diameter were discovered two and one-half inches from the external sphincter. Also five large internal hemorrhoids encircling the anus just inside the internal sphincter. The ulcers were curetted, cleansed and cauterized and the hemorrhoids excised. Patient made an uninterrupted recovery and when examined December 6, 1904, presented a practically normal rectum. She has gained eighteen pounds, diarrhoea is entirely relieved, is able to resume her occupation and has had no recurrence.

Oftentimes ulcerations cause reflex con-

ditions of other organs, such as irritable bladder, sciatica, itching of the genitals and ani, headache, digestive disturbances and even disturbance of vision. The following cases illustrate reflexes referable to the rectum:

Mrs. T., Detroit, age 35, wife of a Detroit physician, complained of sharp shooting pains in the pelvis, somewhat like—yet different from the crampy pains of dysmenorrhoea, a feeling of weight and heaviness in the rectum and sacral aching: some shooting pains down the inside of both limbs.

Examination of the pelvic organs showed no abnormality or mal-position. Rectal examination disclosed a small triangular ulcer of about three and one-quarter area situated on the posterior wall of the rectum. This subsided in ten days under local treatment, and though it is over a year since the patient was discharged, she had no recurrence of any of the above named symptoms.

W. H. E., hotel keeper, age 46, Oscoda, Mich., was brought to the writer suffering from the following pains and symptoms: Insomnia, indigestion, difficult defecation, pain after urination referable to the end of the penis and a burning of the neck of the bladder. Stone was suspected by his family physician but a diligent search of the bladder showed the absence of any stone. Prostate was examined and found normal, but two internal hemorrhoids were discovered with a deep fissure dividing them. These were incised after the rectum had been thoroughly divulsed and the patient left the hospital at the end of two weeks entirely recovered. A letter received from him six months later stated that he had entirely regained his former health, had gained 30 pounds in weight, slept well nights and felt, as he expressed it, "a new man and ten years younger."

The author could report scores of such

cases if time and space would permit, but believes that a case or two of each class is sufficient to illustrate the value and importance of early examination of the rectum. The author has treated cases which have been examined by the family physician but whose examination consisted simply in the insertion of the index finger into the rectum and a glance at the perineum. Rectal ulcerations can rarely be felt by the finger; they must be seen through the protoscope. If one would aim to achieve success in a great many baffling reflex conditions, and if he would make a routine practice of examining the

rectum of any patient for whose symptoms he can find no other cause; in a not small percentage of the cases will he find these symptoms are due to ulceration either high up in the rectum or within the grasp of the sphincters, and a great many conditions thus found can be relieved, not as was formerly done, by the administration of a general anesthesia but by the use of local anesthesia, either a mild eucain solution or, better still, what the author is using for practically all of his uncomplicated rectal cases, the production of artificial anaemia by the infiltration into the tissues of sterile water.

The Contagiousness of Erysipelas.—The idea that erysipelas is a virulent type of contagious disease has taken such a firm hold on both the lay and professional mind, that even the apparently complete refutations based on advanced bacteriological investigations, have thus far failed to overcome it entirely. The fear of contact with the afflicted one makes the latter an object to be zealously avoided, and if he happens to be an inmate of a hospital ward, immediate and complete isolation is his fate. And yet there may be others present infected with much more virulent types of organisms, who are not considered for a moment any source of danger to the other patients. It is proper to ask why erysipelas is so sharply differentiated from inflammatory processes depending on bacterial infection of a similar kind.

A defect in the epithelial covering of the skin or mucous membrane is quite generally admitted to furnish an entrance for the pathogenic organism which produces erysipelas, and this in itself marks the disease as a wound infection. It also furnishes a sharp contrast to the picture afforded by the course of a typical contagious disease which is disseminated through the air or by an intermediary. Erysipelas has ceased to be the *bete noir* of hospital surgery, but how much of this favorable result is to be ascribed to our more complete knowledge of wound infection and wound treatment, how much to the better training and control of the ward attendants, need not be discussed here. There is no doubt of the fact, however, that reports of erysipelas epidemics have about disappeared from our literature.

A great deal of the mystery surrounding this disease has been cleared up by the observations of recent investigators. These results should be more generally known, in order that patients thus afflicted may be freed from the opprobrium so often attached to them, and which is only satisfied by their complete and to them certainly most annoying, isolation. There is no reason to question the facts obtained by these writers, because they are based on careful bacteriological investigations. The

most recent is by Franke of Prof. Konig's clinic (*Deutsche Zeitschrift fur Chirurgie*, Vol. 78, No. 1), who has succeeded in demonstrating that the streptococcus gains entrance through minute and often unnoticed wounds in the skin or mucous membranes, and then continues its growth in the lymphatic channels of the cutis. Erysipelas may, therefore, be defined as a lymphangiomatous disease, and in no instance was it found that the germs returned to the surface of the skin, and were present in either the scales or the bullae. Whether the streptococcus produces an erysipelas or a cellulitis possibly depends on the size of the wound and the depth to which the organism may have penetrated, and finally, on the virulence of the particular strain. It seems evident, therefore, that the patient is not a source of danger to his surroundings, so long as the surface of his skin remains intact. When he indulges in scratching, however, in order to relieve the intense itching, the corium is likely to be lacerated, and the exuding fluid has been proved to contain the streptococci. In this manner the infectious material may unconsciously be distributed and so, in order to avoid further dissemination of the disease, it is essential that the dispersion of the germs be limited by the application of proper occlusive dressings; when this is properly done the patient need not, as a rule be isolated. The exception deals only with cases in which sufficient dressings for the purpose are impracticable, as in facial, perineal, and some other locations of erysipelas. Here it will be more convenient to isolate the patient until the inflammatory stage has disappeared, but the isolation need not be prolonged beyond this period, as the desquamative stage has been shown to be without danger.

When, then, the diagnosis of erysipelas has been made, Franke contends, one need no longer continue to regard the patient in abject terror. The disease should be viewed in the same light as any other condition depending on wound infection, and treated accordingly. (*Editorial Medical Record*, September 30, 1905.)

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Editorial.

DR. BIDDLE TO RETIRE AS SECRETARY-EDITOR.

I sincerely regret that, owing to the pressure of other professional work and of private interests, I have been compelled formally to notify the Council that it will be impossible for me to accept another appointment as Secretary of the State Medical Society (who by virtue of his office is Editor of the Journal), after the expiration of my present term next January. As the Managing Editor and Collaborators are the appointees of the Editor, they will retire with him in order that the incoming Editor may have the privilege of appointing his own assistants. The Secretary-Editor is appointed by the Council at its meeting in January to hold office for one year and is reappointed yearly at the pleasure of the Council.

I desire to take this opportunity to express my thanks and appreciation to the Council, to the Managing Editor and to the Collaborators for their earnest and liberal assistance. Owing to the large amount of detail in connection with the work the State and County Medical Societies, which I personally supervised, my appreciation is extended particularly to the Chairman of the Council, Dr. Leartus Connor, and to the Managing Editor, Dr. Guy L. Connor, upon whom the burden of

the work of the Journal has fallen, for their untiring efforts in its behalf and their many acts of kindness.

To the members of the profession I would express also my appreciation for their leniency with the many necessary shortcomings in the up-building of a Journal in an untried field. My reward has been the pleasure of the acquaintance and personal association with the members of the profession throughout the State, which during the five and a half years of my incumbency of the office has been large and a privilege few enjoy.

I bespeak for my successor the kindly treatment the profession has accorded me. It has been a pleasure to have been one of the active workers during a historical period not only of the profession of this State but of the medical profession of the Union.

A. P. BIDDLE.

OUR DUTY TOWARD PATIENTS IN THE MATTER OF ANESTHESIA.

Each reported death, occurring during the process of the administration of a general anesthetic to a patient, must make the thinking medical man ask himself the question, "Could that death have been avoided?" The answer to the question is not always easy when only a specific case is considered. Far better, let us ask ourselves, "Do we always protect our patients against the possibility of such an occurrence as conscientiously as we ought?"

Assuming that no patient is ever anesthetized without some reasonable cause; assuming that the drug employed is pure and that it is administered by one competent to do it; and eliminating those cases to whom because of their dis-

eased condition the administration of an anesthetic is rightly considered precarious but to whom it must be given to permit necessary surgical attention, it is a fact that each year there occur several hundred deaths which can be attributed directly to the employment of general anesthesia. Many of those deaths in the past could have been avoided and many that will probably occur in the future can be avoided.

It is not for the death of the patient in a late stage of sepsis or malignant disease, whom we are trying to save, that we need censure ourselves; nor is it for the death of the patient whose physical organism, even with the aid of all our skill and conscientious care, is unable to gain mastery over a particular pathological process involving it; but it is for the fatalities that happen in the course of such a simple surgical procedure as circumcision, finger amputation, removal of hemorrhoids, incision of an imperforate hymen or any one of dozens of others as little complicated that we deserve blame.

It makes little difference whether we have permitted the use of chloroform in this case or ether in that; it makes little difference whether statistics show that one death occurs in each two or three thousand cases of chloroform narcosis and one in each eight or ten thousand of ether narcosis or not. If during general anesthesia one death or one hundred deaths occur which cannot be attributed to some cause other than the anesthetic employed, then general anesthesia must be held accountable for that one or those one hundred deaths. As for every death occurring during a surgical operation, which could have been done under anesthesia not general but local, we must hold ourselves to account. We have no right

ever to permit a patient to take the chance of being that "one in three thousand or one in ten thousand," unless it is absolutely necessary; we have no right ever to assure a patient who must take a general anesthetic that there is no danger, and alas! as often as not the danger manifests itself most unexpectedly. How common an occurrence it is that the patient whose chest, on careful physical examination reveals no abnormality, is the very one who succumbs to paralysis of the respiratory center or to cardiac failure and does not respond to the most prompt and thorough efforts at resuscitation; and how often it is that that patient was "only going to have an operation for ingrowing toe-nail or fistula-in-ano." It is perhaps only fair to assume that those cases, in which the operation was a comparative triviality, are the ones that receive undue prominence; yet they happen with alarming frequency.

With reference to general anesthesia then, there is safety only in believing that there is ALWAYS danger in its employment; so much danger, in fact, that its aid should be enlisted only when a patient cannot by other means be safeguarded against unbearable pain.

The medical profession at large seems to fail totally in appreciating the comfort to itself and the value to the patient of local anesthesia, specifically to that form known as infiltration anesthesia. To topical anesthesia, as first employed by means of injected cocaine solutions, there were many well founded objections; the drug had to be used in such quantities that one always had to fear a possible systematic toxic effect. This is, of course, much more true of cocaine solution when injected and therefore under tension than when it is applied to a free absorbing

surface. Anesthesia induced by infiltration, however, is based upon an entirely different principle. It is not the chemical effect of any of the materials in the solution upon the sensory nerve endings that obtunds sensation; it is simply a pressure paralysis brought about by the tremendous edema of the tissues, edema artificially produced by injection into the tissue to be anesthetized. This is not a proper place to speak in detail of the composition of the solutions made known by Schleich, the pioneer of infiltration anesthesia; it may be said, however, that the proportions of cocaine, morphine and salt in distilled water were made so simply to make the solution non-irritating to the tissues and to prolong, to some extent, the anesthesia produced. They are used in such small quantities that toxic effects are impossible, even though very large quantities of the solution are employed. They in no way affect the intensity of the anesthesia; this is wholly and entirely dependent upon the establishment of sufficient edema of all the tissues that are to be wounded in the course of operation.

The infiltration method is employed by too few men and too infrequently by those who use it at all. Its range of usefulness is wide, very wide indeed, if one becomes as proficient in its employment as Schleich himself, who does ninety per cent. of his operative work with it. Even those less skillful or rather less experienced find that each week subtracts one operation from the general anesthesia class and adds it to the infiltration department. The comfort it gives to a patient, who always fears chloroform or ether more than he does the operation, to be told that he does not require general anesthesia and the great relief it is to the conscientious

surgeon, who simply can't help watching his anesthetic, to be able to pay attention only to the work in hand, invite the more general employment of this form of anesthesia; but a much more important factor than these considerations, the safety of the patient, DEMANDS that infiltration anesthesia be employed in every case where it is possible to employ it.

W.M. A. SPITZLEY.

THE FIFTH PRACTICAL YEAR.

The idea of an obligatory fifth practical year in a hospital before receiving the license to practice medicine is not a new one. The advantages of a fifth practical year are obvious. A graduate of one of our most esteemed medical schools told the writer that he was painfully handicapped when he entered practice by the lack of bedside experience. We all know how different medicine looks from the benches of the amphitheatre and from the bedside of the patient when responsibility is added to the burden. We are gratefully conscious of the many advantages which we enjoyed as externes and as internes.

It has appeared to the writer that the training as an interne enables a young man to discriminate more quickly between the more essential and the less important symptoms. This education allows the mind to reach conclusions subconsciously so to speak. The so-called intuition is explained in this manner. The conclusions must, of course, be tested and verified by exact methods. An interne in the hospital enjoys advantages which are sometimes superior to those of a visiting physician or surgeon. He sees a number of patients suffering from identical or similar diseases and has an opportunity to compare the methods of diag-

nosis and treatment of the various chiefs. The partial responsibility attached to the internship is an excellent preparation for the future. The condition of partial responsibility which is a logical link in medical education is a necessary part in the evolution of a physician. It can also be applied to outdoor practice. The writer remembers, thankfully, the advantages which he shared with others at the University of Heidelberg. The whole city was divided into districts and each student was obliged to treat for a certain term the poor of the district in their homes under the supervision of an assistant of the polyclinic which was under the charge of Professor Vierordt. Our prescriptions were as a rule filled in the university pharmacy, except in emergency cases. We were obliged to use special blanks so that the druggists knew that a certain control was necessary. Once a week a thorough critical review was held by Professor Vierordt who inquired about the reasons for diagnosis and treatment in a given case, about the prognosis and any other feature, also about the results of examination in the laboratory. Possible mistakes in prescription writing were also criticised. Especially difficult and serious cases were seen by the professor himself at their homes. The unanimous approval of the idea of a fifth practical year by all with whom the writer had the opportunity to speak and the feasibility of its introduction may soon make the same a reality also in our country, and thus mark another step in the advancement of medicine in the United States which has made such splendid strides within a few years.

EMIL AMBERG.

County Society News.

BENZIE COUNTY MEDICAL SOCIETY.

The officers elected for the ensuing year are: Dr. G. O. Edmunds of Honor, President. Dr. E. J. C. Ellis, of Benzonia, Secretary. Dr. John Powers of Benzonia, Treasurer.

Hereafter the Benzie County Medical Society will meet quarterly, the first Wednesday in September, December, March and June.

The next meeting will be held in Benzonia, Dec. 6, 1905.

E. J. C. Ellis, Sec.

SUCCESSFUL OBSTETRICAL PRACTICE IN FILTHY HOMES.

Read by Dr. G. O. Edmunds, before the Benzie County Medical Society.

In these days of great advancement in the methods of surgical and obstetrical asepsis there are few practitioners of midwifery located in the smaller towns but realize the difference in their obstetric technique from that laid down in the more modern works on obstetrics. I dare say that if the author of any of the books on this subject were called to deliver some women that I have attended he would very promptly beat a retreat.

The object of this paper is to draw attention to the possibility of doing really good clean work under the most trying circumstances and in the most unclean surroundings; and to do this without any extraordinary or degrading labor.

The position of affairs is this. A reasonably busy country practitioner is summoned to attend a woman in labor. The pay is to be ten dollars "when you get it." On arriving you enter a cabin perhaps fourteen by twenty feet. A scene of dirt and untidiness is presented. There is no other than cistern water, no wash bowl other than a most suspicious looking tin bowl of about two quarts capacity and no towels other than the dirty rag hanging on a nail. The patient need not be described for what does she know of germs and their awful relationship to puerperal fever, mastitis, etc. The bed is perhaps already made up. You proceed to examine and find over the mattress the old oil cloth table cover, then an old and filthy comforter, then sheets which you find on enquiry are "clean" and covering all another comforter. For an absorbent pad you may find a piece of old rag carpet. Such is a brief description of the not unusual sur-

roundings of obstetrical cases occurring in country practice.

Normal afebrile convalescence is quite practicable and almost invariable with such unpromising surroundings if the practitioner will do his best under the circumstances to keep whatever comes in contact with the genitals clean. Therefore a brief description of my methods of work may perhaps prove useful, and be the means of bringing out many more valuable points in discussion.

Besides the usual instruments and accessories described in all text books the following are placed in my obstetrical outfit:

1 pound of absorbent cotton.

3 ounces of Etherial antiseptic soap.

A five cent hand brush.

A fountain syringe.

A large size rubber obstetrical pad and several towels.

Where time will permit the bed is remade to shake out crumbs, vermin and detritus of various kinds. If practicable some cleaner sheets are obtained and the upper sheet is pinned up over the upper comforter at the head, one side and foot of the bed. This gives a ready access to the parts without getting the examining hand mixed up with the bed clothing. The rubber obstetrical pad is then placed in position and the bed closed until the patient is undressed and ready to go to bed for the final stages of labor. Any examinations before this time are made on the outside of the bed with an extra cover. Having had the wash bowl cleaned up a little, the freshest water obtainable and the hottest that can be borne is used for washing. The nails being cleansed, a quantity of etherial antiseptic soap is poured on the hands and arms and thoroughly rubbed in. A good scrubbing and washing is then done and repeated at least once. The woman is instructed to wash the abdomen, the thighs and genitals and to lie down on the outside of the bed for examination and to cover herself. From this time on two distincts hands are kept in mind,—the left to handle the bed clothing and other probably germ laden objects,—the right to make the necessary examinations and manipulations. Having annointed the first two fingers of the right hand with the etherial antiseptic soap, the left hand is passed beneath the cover and raising the clothes an unobstructed passage for the right hand is made. With the index and middle fingers in the palm of the hand the right hand is passed to the genitals and

the examination made. This examination should be thorough and subsequent examinations as infrequent as possible. When it is time for the woman to take to her bed a quantity of absorbent cotton is placed on the pad and the undershirt and night dress being held above the waist she lies down on the absorbent cotton. It is usually preferable to have the woman wear a pair of clean stockings. As labor progresses, free use of the cotton is made to keep the pad dry and the field of work clean. When the second stage is well under way some one else is requested to handle the bed clothing and assist with probably infected things while both hands having been cleansed are ready for the final manipulations. All instruments used are boiled in soda water. If a perineal laceration occurs it is immediately repaired with frequent irrigation of the torn surfaces, with a 1% solution of carbolic acid. When any obstetric difficulties are encountered the woman is usually placed across the bed and all clothing drawn back out of the way.

Douches are entirely avoided until the third or fourth day unless there is evidence of infection. Douches should never be given the first day or two except by the accoucheur himself. A castor oil purge is routine practice on the morning of the third day.

Absorbent cotton is applied as a napkin for as long as the pound will last and by this time the danger of infection is greatly reduced, and there has been time to prepare clean napkins and clean sheets. The mother's nipples are washed after each nursing with a 3% solution of boric acid, and the baby's eyes and mouth with a similar solution twice daily. The cord is dressed with boric acid and gauze and the "nurse" instructed to keep it dry and not grease it. Rarely is a binder used and if used the napkin is never allowed to be pinned to it. The napkin is simply placed against the genitals.

While there is abundant opportunity to criticise the above outlined methods it should be remembered that time will not permit of a thorough disinfection, even if the obstetrician is inclined to do such a job and that the fee is only \$10.00 "when you get it."

DICKINSON-IRON COUNTY.

At the July meeting, Dr. B. W. Jones, President of the Dickinson-Iron County Medical Society, sent the following paper, reporting a case of tetanus:

A CASE OF TETANUS.

B. W. JONES,
Vulcan.

H. W., female, single, age 19, Swedish, large, strong, healthy girl, on May 1, stepped on a sharp nail making a deep punctured wound on sole of right foot. The wound was treated antiseptically for one week, when it was apparently healed.

On May 12, she felt a slight stiffness of the muscles of the jaw and neck.

May 15—3 days after onset of first symptoms, I saw her, for the first time.

I found her with marked rigidity of the jaws, right foot, leg and thigh, and painful spasms of the muscles of the leg and thigh occurring every 3 or 4 minutes, temperature and pulse normal. The sole of right foot showed a small punctured wound, apparently healed, and without pain or tenderness on pressure. I called in Drs. Swift and Schwartz in consultation, who immediately confirmed the diagnosis of tetanus. The use of antitetanine was begun at once, and continued for 5 days, during which time she was given 220 cubic centimeters, without apparent benefit.

On May 18, the pain and spasms in leg having increased and she having had 2 very severe attacks of dyspnoea with convulsions, caused by spasms of the muscles of the chest and back, with opisthotonus, I decided to open and examine the wound in the foot. This was done under chloroform. In probing the wound with a grooved director I got a small quantity of granular, slightly pussy looking material which was causing no pain or soreness, but which was evidently being absorbed. I immediately proceeded to make thorough drainage, using a gauze drain, saturated with per oxide of hydrogen. May 19, began giving deep hypodermic injections of a 2% solution of carbolic acid, as recommended in Senn's Principles of Surgery. The injections were given deeply over the course of the sciatic nerve, giving about 3 grains of pure carbolic acid daily in 2 doses, morning and evening.

The injections caused no pain or inconvenience of any kind. Improvement now began to be perceptible and the injections were continued daily until June 8, at which time drainage was also discontinued and the wound was simply irrigated with per oxid daily until healed. May 12, allowed patient to sit up for a short time, all pain and soreness having disappeared a week before and only a slight stiffness remaining in foot and jaw. Before be-

ginning the use of carbolic acid, she had 3 very severe convulsions with spasms of the muscles of the chest, which threatened immediate suffocation, and several lighter attacks, but none after the use of the acid. Obstinate constipation from rigidity of the abdominal muscles persisted from the time I first saw her on the 15th of May until the 30th of May, over two weeks, resisting large enemas and cathartics, the urine was normal. Morphine was used hypodermically to allay pain and produce rest until the 28th of May when chloral was substituted with excellent effect.

Recapitulating important points we find that the period of incubation was 12 days. That the first symptoms of tetanus had made their appearance 3 days before medical aid was called. That the disease came on and progressed in spite of the fact that the wound was carefully and skillfully treated until it was apparently healed, the physicians treating it being fully aware of the importance and dangerous nature of such a wound. May 15, the first dose of antitetanine used and continued for 5 days until 220 C. C. were used, producing no apparent effect in lessening the severity of the disease, but on the contrary the symptoms becoming more severe. Opening and curretting of the wound, 18 days after the injury. The finding of a small quantity of granular pussy looking material, which undoubtedly contained the germs of tetanus. Drainage of the wound with gauze drain, saturated with per oxide of hydrogen. The use of carbolic acid injections given over the course of the principal nerve leading from the wound. Drainage being continued 22 days and several daily injections of carbolic acid, continued twice daily, for 19 days, the use of per oxide of hydrogen as a disinfectant and dressing because the tetanus bacillus being an obligate anaerobic germ, it will not develop in the presence of oxygen. The importance of opening and draining such a wound at any stage of the disease, on account of the fact as given by Loeb in his Special Medical Diagnosis: That no gross pathological changes occur in any of the internal organs the bacilli also being absent, he assumes that the bacilli remain at the point of invasion and from there the toxic products of metabolism invade the body.

LIVINGSTON COUNTY.

The Livingston County Medical Society held its annual meeting, September 12th, at the Whipple House, Howell.

The following officers were elected for the ensuing year:

Pres., A. W. Cooper, Fowlerville; Vice. Pres., W. H. Erwin, Oak Grove; Sec'y and Treas., R. H. Baird, Howell; Directors, J. M. Brigham, Howell; C. L. Sigler, Pinckney; R. N. Hodges, Brighton; G. E. McGregor, Fowlerville; C. E. Skinner, Howell.

Subject: "Differential Diagnosis of Appendicitis."

Meeting adjourned to Dec. 12, 1905.

R. H. BAIRD,
Secretary.

OAKLAND COUNTY.

The fourth annual meeting of the Oakland County Medical Society was held in Pontiac, September 12th. Reports of officers were received and Dr. W. J. McNeill, alternate delegate, gave an interesting account of the Petoskey meeting. The principal paper of the day was by Dr. Carlton D. Morris of Pontiac, on "Why and when should the pharyngeal tonsil be removed."

WHY AND WHEN SHOULD THE PHARYNGEAL TONSIL BE REMOVED.

C. D. MORRIS.
Pontiac.

The pharyngeal tonsil is a physiological structure, normally present in children, and should atrophy between the 12th and 20th year of life. If it exists in normal condition during these years, it causes little or no annoyance. But from its location it is easily understood how any little congestion may cause sufficient enlargement to completely block the nasal passages.

Free circulation of air through these passages, as well as the action of the muscles controlling the nasal orifices are factors of importance in controlling the size of the nasal cavity. If the respiration is impaired, there is an ill-formed superior maxillary arch, with marked inequality of the teeth. The continuous snuffing is accompanied by a drawing down of the facial muscles which retracts the upper jaw and alters the contour of the upper arch. The hard palate then instead of forming a perfect dome has its anterior portion tilted out and the portion at the base of the nose drawn in. The labio-nasal fold is lost, the nose is flat and broadened, the lips are thick and protruding and the chin recedes giving the child a peculiar stupid, idiotic or expression-

less appearance. The enlarged adenoid structure impinges on the openings at the eustachian tube, thus interfering with the proper ventilation of the tympanum. This leads to eustachian catarrh, and catarrhal conditions of the middle ear and, if infection occurs, it leads to chronic suppurative conditions, involvement of the tympanum and possibly bony necrosis. Earache and discharging ears are very common complaints in these cases. For the interference with the nasal respiration, the child is obliged to breathe through his mouth. The disuse of the nasal passages also favors their lack of development and when their bony framework becomes firmly united and fixed, the capacity for nasal breathing is more or less permanently fixed. It is then too late to alter their contour or to repair the damage done. The relief must come while the child is young and growing. He is indifferent though. The parents are careless or ignorant of the terrible consequences. It is through you as general practitioners that we must look and hope for relief. You see many more cases than do we as specialists and on you must rest the great responsibility of their dark future, if you neglect them.

There is only one method of procedure that will reflect credit on our profession. In this instance above all others radical methods are much safer than conservative ones. Inactivity is positively dangerous. Neglected cases become more and more deaf. The discharge increases and becomes very offensive, perforation of the drums occurs, the child becomes more and more peevish and fretful, pale and ill-nourished and more and more susceptible to diseases of an infective nature. But with operative interference all is changed. The child then becomes, bright, active, robust and ambitious. The facial expression changes. The nasal passages develop. The child ceases to snore at night. He sleeps soundly and awakes in the morning rested and ready for a hard day's play. The appetite improves. The digestion and assimilation are much more nearly perfect and the child's condition in general is entirely changed.

The parents and the little patients themselves will later be ever grateful to you for your timely help in this really very distressing and dangerous condition.

The following officers were elected for the coming year:

President, R. LeBaron.
Vice-President, C. J. Sutherland.
Sec-Treasurer, M. W. Gray.
Directors, E. A. Christian, N. B. Colvin, Wm. McCarroll.

Mason W. Gray, Secretary.

VAN BUREN COUNTY.

The Van Buren Co. Medical Society held its regular meeting at Bangor, Sept. 14th. Dr. C. L. Bennett read a paper on "The Use of Formic Acid in Rheumatism."

J. R. Giffen, Sec.

THE USE OF FORMIC ACID IN RHEUMATISM.

C. L. BENNETT.
Gobleville.

The subject I am about to present, namely, Formic acid in the treatment of rheumatism, is one I feel I should apologize for selecting, on account of my limited knowledge of it. However, in one of the June numbers of the Medical Record my attention was called to the experiments of Louis Bradford Couch, of N. Y., on the treatment of rheumatic conditions with this drug, formic acid. This is all the literature I have been able to find on the subject, hence I will only give my own experience (on the subject), in the treatment of these conditions.

Soon after reading the article I was called to see a case of arthritis deformans.

It was a woman 50 years old, who had been a sufferer for 15 years, and for the last two years had been unable to walk and most of the time she could not move her legs without excruciating pain.

Examination showed the knees to be swollen and shiny with many extremely painful points on the slightest pressure.

The crackling crepitus so characteristic of this disease was very manifest and many of the finger joints were ankylosed.

At this time she also complained of severe pain in the left shoulder, in fact, it was for this that I was called to see her. This pain was very excruciating and she would cry out in agony on the slightest movement of her arm.

I regarded the case as a good one on which to try the formic acid and began accordingly.

The formic acid used must be C. P. and the strictest aseptic conditions observed in its use. A $2\frac{1}{2}$ -4% solution is the proper strength, better the former on account of the severe pain caused by its injection. The pain can be relieved greatly, though, by first using a 1% solution of cocaine.

The part to be treated should first be cleansed with soap and sterile water, then

washed off with alcohol and rubbed dry with antiseptic cotton or sterile gauze.

On July 12, '05, I made 7 injections of $\frac{1}{2}$ gts. each, in each knee, first of the cocaine 1% and then the formic acid $2\frac{1}{2}\%$. The injections were made about 2 inches apart and just subcutaneous. Some of these caused considerable pain, but it lasted for only a moment.

The next day I called; the pain had left in her shoulders, but the knees felt very sore, in fact, she thought they were worse than on the previous day. However, I think, considerable of the soreness was from the injections, for several of the spots showed discoloration as if they had been bruised. Aside from this soreness, she said she felt very comfortable.

On July 15, I saw her again and made 8 injections in each knee, of the cocaine and formic acid as I had done before.

I did not see her again until the 25th, but was informed in the mean time, that she felt very well and could sleep better than she had been able to for months before. She had no pain, except occasionally on moving the knees, they would "catch" as she would express it. The left knee showed the greatest improvement and she was able to straighten it out more than she had been able to before for two years, and she could run her sewing machine without experiencing any pain whatever.

She remained comfortable with practically no pain or discomfort, that was until Aug. 24, when I was called to see her again. The pain had returned in her shoulder, though not so bad as before, and her knees had been hurting her more for several days. I at once made eight injections in the shoulder and within two hours the pain had left her and has not returned since.

The next day I called again and made fifteen more injections in her knees. At this time I noticed that every time I withdrew the needle from the skin a drop of blood and sometimes a stream would follow, showing the capillary circulation had been very much increased, for on previous occasions and ordinarily no blood flows from the mere prick of a hypodermic needle. During the treatment I forbade the use of all liquid at the meal and for some time after, say one hour. She was also instructed to masticate her food very thoroughly and to eat nothing that contained pepper, mustard, pickles, sweets of any kind, drink coffee or any form of stimulants.

These last details with regard to diet, she

still observes and unless she continues to be careful in this line, her chances of recurrence of the pain is much more liable.

My second case was that of a man who was affected with what he called a stitch in his back. He had these attacks, usually about twice a year and was ordinarily laid up two weeks at a time.

He could not raise himself in bed or roll over without experiencing the most excruciating pain.

I at once made 17 injections in his lumbar muscles and in two hours he could raise up in bed without pain, and in 48 hours, except for his back feeling weak, he felt as well as ever and resumed his labor, whereas, before he was laid up about 2 weeks.

My third case was a man 40 years old, who had had rheumatism in his left shoulder about a week. He had tried all the home remedies he knew of, but the pain kept on, in fact, it had been getting worse all the time. I made 7 injections in his shoulder and in 24 hours he said the shoulder felt as well as ever, and he went back to his work.

To say formic acid is a specific in all kinds of rheumatic conditions is perhaps saying too much; however, I believe it to be a remedy well worth our careful trial as it will certainly allay the pain in these conditions more quickly than any thing I have used, except morphine, and I regard that as a very dangerous drug to use in any chronic disease.

My idea in selecting this subject was, not to demonstrate any very extensive knowledge of it, but in the hope that I might gain some knowledge from its discussion, also if there is any one present who is not using it, he will perhaps try it, that we may profit by his experience.

In conclusion allow me to suggest the following points which should always be borne in mind:

1. Cleanse the parts thoroughly before making your injection.
2. Use C. P. formic acid and never stronger than a 3%, or better 2½%.
3. Always inject a 1% solution of cocaine before using the acid, waiting about 5 minutes between.
4. The injection should be subcutaneous and about 5/8 drops of each solution used at a time.
5. Inject the most painful points and place the injections at least 2 inches apart.

WAYNE COUNTY.

At the meeting of the Section of Internal Medicine of the Wayne County Medical Society on September 11th, two papers were read. The first paper was by Dr. W. J. Wilson, Jr., on "Modern Therapeutics and the New Pharmacopoeia." The second paper was on "The Classes of Prescriptions Physicians are writing." by Mr. Wm. A. Hall, ex-President of the Michigan Pharmaceutical Association. The latter paper excited much interest and discussion as it was based on the records of 7,500 prescriptions collected from 15 localities in the state. Mr. Hall separated the prescriptions into 5 classes, as follows:

- 1st. Proprietary remedies.
- 2nd. Ready made pills and tablets.
- 3rd. Single pharmaceutical remedies.
- 4th. Two or more simple pharmaceutical remedies.
- 5th. All others; i. e., those requiring more or less skill in compounding.

The percentages of each class of prescriptions he found to be, for Detroit and Grand Rapids: 1st class, 18.4 per cent.; 2nd, 9 per cent.; 3rd, 15.2 per cent.; 4th, 26.4 per cent.; 5th, 30.1 per cent.; while for the other cities and villages in the state the percentages were:

1st class, 13.2 per cent.; 2nd, 9.3 per cent.; 3rd, 20.7 per cent.; 4th, 29.3 per cent.; 5th, 12.1 per cent.

The papers were discussed not only by members of the society, but also by a number of pharmacists who had been invited to be present.

Correspondence.

SUPPRESSION OF MEDICAL NOSTRUMS.

Editor:—I find that I failed to officially call your attention to a resolution which was unanimously adopted at the last meeting of the House of Delegates of the American Medical Association. The resolution referred to was introduced by Dr. E. Eliot Harris, of New York City, and is as follows:

"RESOLVED, That the committees on publication of the journals of medicine published by the state medical associations affiliated with this body be asked to assist the Board of Trustees in their efforts to suppress the advertise-

ment of the medical nostrums and to co-operate in the work of securing pure food and pure drug laws in the United States."

Respectfully yours,

GEORGE H. SIMMONS,

General Secretary,

American Medical Association.

Chicago, Oct. 11, '05.

THE AMERICAN NATIONAL RED CROSS

Neutrality : Humanity

WASHINGTON, D. C.

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Detroit Oct. 9th, 1905.

A. P. Biddle, M. D.,

General Secretary, Mich. State Med. Soc.

Dear Sir:—I have much pleasure in acknowledging your favor of the 5th inst., in which you give me a copy of the resolution adopted by the Michigan State Medical Society endorsing the Michigan State Branch of the National Red Cross. I wish to assure you of my appreciation of this endorsement, and I hope that it will encourage the people to join in the good work.

We are just now endeavoring to obtain members to the Society, as I did not wish to make the effort while people were away from home for the summer. We hope to receive great encouragement.

Yours very truly,
Hugh McMillan.

THE MICHIGAN
STATE SANATORIUM FOR TUBERCULOSIS

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Detroit, Nov. 1, 1905.

Secretary:—The project of the Medical Profession of this State to provide a Sanatorium for the dependent class suffering from incipient tuberculosis, has been furthered through Governor Warner by the appointment of a Board of Trustees. The committee of the State Med-

ical Society secured an appropriation of \$30,000.00 from the last legislature of which \$20,000.00 is available the first year for building and maintenance, and the remaining \$10,000.00 is intended only for the maintenance during the second year. The trustees are now ready to proceed with the founding of the institution, as far as the funds permit. The board is impressed with the importance of finding the best locality from a sanitary and a climatic point of view, and solicit your aid in the matter, more especially your opinion as to the suitability of the lands in your county for such purpose. The following conditions in the order named are regarded as necessary for a modern Sanatorium site:—

General accessibility by railroads and trolley line from the more thickly populated districts of the State.

Accessibility to fresh food supplies, preferably from surrounding farms, such as fresh eggs, milk, butter and vegetables.

Elevated regions and sandy porous soil with abundance of fresh water supply and facilities for good drainage.

Low degree of humidity and equable temperature with woodland to protect from prevailing winds. Slightly surrounding country such as hills, small lakes, and general scenic effects.

The site should consist from one to two hundred acres of land. As only incipient cases of tuberculosis will be treated and with the inmates under strict sanatorium discipline, this new institution cannot possibly prove a menace to the neighborhood in which it may be located; on the contrary, experience has proven that Sanatoria for tuberculosis are a distinct benefit to the country, not only commercially, but also in a hygienic way. The educational value on health of Sanatoria is most beneficial, for it is a matter of record that tuberculosis decreases in the immediate vicinity for the reason that citizens learn from such an institution in a practical way, how to prevent and cure the disease. For this reason and for the fact that the appropriation is very small, the trustees feel warranted to solicit the donation, of a suitable site from individuals, village or city corporations. We earnestly request the early co-operation of every member, in order that this humanitarian movement may be speedily and efficiently put into operation.

Very respectfully,
Henry J. Hartz,
President.

Book Notices.

The National Standard Dispensatory.—Containing the Natural History, Chemistry, Pharmacy, Actions and Uses of Medicines, including those recognized in the Pharmacopoeias of the United States, Great Britain and Germany, with numerous references to other Foreign Pharmacopoeias. In accordance with the United States Pharmacopoeia, 8th decennial revision of 1905 by authorization of the Convention. By Hobart Amory Hare, B. Sc., M. D., Professor of Therapeutics in the Jefferson Medical College, Philadelphia, Member of the Committee of Revision of the U. S. P.; Charles Caspari, Jr., Ph. G., Phar. D., Professor of Pharmacy in the Maryland College of Pharmacy, Baltimore, Member of the Committee of Revision of the U. S. P.; and Henry H. Rusby, M. D., Professor of Botany and Materia Medica in the College of Pharmacy of the City of New York, Member of the Committee of Revision of the U. S. P. Imperial octavo, 1858 pages, 478 engravings. Cloth, \$7.25, net; leather, \$8.00, net. Thumb-Index, 50 cents extra. Lea Brothers & Co., Publishers, Philadelphia and New York, 1905.

A superficial consideration might leave the impression that The National Standard Dispensatory coming as it does at the same time as the revised U. S. Pharmacopœia is superfluous. This would be a very erroneous conclusion. These two great works have very different functions and are not in competition. They have different positions in the new movement to improve and widen the scope and efficacy of rational therapeutics. It is only after a remedy has been tried and proven for a number of years and its uses more or less definitely known, that it can receive a place in the pharmacopœia. But there are many valuable remedies and some of the most valuable, that do not appear in the U. S. Pharmacopœia.

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OPHTHALMOLOGY.

A Study of Failures in Ophthalmic Practice.

—George M. Gould sets forth the details of fifteen reasons for failures to relieve the common systemic results or reflexes of eyestrain:—(1) The want of a single good refraction school in the world. Instead of ophthalmology, being as Helmholz said, the most accurate and scientific of the departments of medicine, he thinks it the most inaccurate and unscientific; and this is due to the lack of systematic and adequate training in the difficult art of refraction. (2) Bad case-recording, omitting the life history of the patient's ailments, or "the biographic clinic," leaves the cure or non-cure unknown or indefinite. (3) The inexperience, ignorance, or impertinence of the optician, incapable of doing his proper work, and aspiring to be an oculist, also prevents good results. (4) Changes in the patient's refraction, not followed by retesting and changes in glasses are another source of failure. (5) Incorrect diagnosis of ametropia is the most frequent cause of failure. (6) The presence of head-tilting often causes an inexact placing of the axis of astigmatism. (7) The morbid writing posture, coupled with its result, lateral spinal curvature, continue the consequences of eyestrain. (8) Non-allowance for the patient's personal equations may frequently account for non-success. (9) Tenotomy for heterophoria does not cure the cause of the heterophoria, which is ametropia. (10) Ascription of the morbid symptoms to general disease will not end in cure if they are due to neglected eyestrain. (11) Subnormal accommodation is far more frequently present than is suspected, and distance correction of the ametropia alone will not give relief. (12) "Hysteria" often caused by eyestrain may persist, when chronic, although the eyestrain has been neutralized. (13) Patients living at a distance because they cannot be watched closely, are likely to prove "failures." (14) Despair of curing in an obstinate case may lead to too speedy renunciation of effort. (15) The secondary results of long-continued eyestrain may be too chronic or deep-seated to cure at once or to cure at all. Despite all these reasons, however, it is contended that in no department of medicine are the cures so near 100 per cent., so speedy, or so gratifying as in skilled refraction work.—*Medical Record*, September 30, 1905.

Asthenopia due to Latent Hyperphoria.—C. DeHayne Hallett describes a case of severe and

agonizing neuralgic headache, which had occurred frequently during a period of fifteen years. The headache would incapacitate the patient for work and confine him to a dark room for several days at each occurrence. He had been treated by two competent oculists without relief. The author found that there was a combination of astigmatism and lack of muscular balance in the eyes, the muscular error in the two eyes being exactly opposite. After correction by prisms of the hyperphoria revealed by examination, it was found that there was a larger amount of latent than of manifest hyperphoria, and an increased correction was made on two occasions, with the result of permanent relief of the headaches.—*Medical Record*, October 7, 1905.

Differential Diagnosis of Intraorbital Tumors.—F. B. Tiffany, Kansas City, Mo. (*Journal A. M. A.*, Sept. 30), remarks that, as in the case he reports, a differential diagnosis of the nature of an intraorbital tumor can not always be made, but that as a rule, with careful examination and definite knowledge of all the symptoms, one can be fairly certain of the real nature of the growth. Malignant tumors run a rapid course and sooner or later cause pain, sometimes severe, and if unchecked they destroy vision and attain enormous dimensions. Benign tumors, on the other hand, grow slowly, rarely cause pain, and do not usually destroy vision, unless they produce optic neuritis and atrophy by pressure on the optic nerve. One symptom, proptosis, is common to all forms except a luxated lachrymal gland, and the direction taken by the exophthalmos indicates the locality of the tumor. If on palpation the growth is hard and immobile, it is probably osseous, especially if of slow development. If soft and fluctuating it may be serious, phlegmonous or sanguinous. If soft and yielding without fluctuation or pulsation, it may be fatty, as a lipoma. If less yielding, it may be fibroid or glandular, as an adenoma. Pulsation and bruit ceasing with pressure on the carotids characterize vascular tumors, but it is difficult to determine the varieties of pulsating tumors. The vascular are more resistant than aneurisms and patients with angioma complain of a knocking, roaring or buzzing in the head and ears. In angioma, in all cavernous tumors and in aneurisms, the exophthalmos, is reduced on pressure or when the patient takes the supine position. Tiffany reports at length a case illustrating some of the difficulties of diagnosis.

GYNECOLOGY.

A Case of Combined Extrauterine and Intrauterine Pregnancy.—H. T. Miller's patient was a woman of forty who had had two children, six and fourteen years previously. In the fall of 1904 symptoms developed which indicated an extra-uterine pregnancy, and when she came under the author's care in May, 1905, this diagnosis was made. On opening the abdomen a cystlike tumor having a pedicle containing the right fallopian tube was removed. The cavity of the sac was distended with dark colored blood and contained the remnants of a placenta and degenerated fetus. The size of the uterus gave rise to the suspicion of an intra-uterine pregnancy, which was verified on the second day after the operation by the spontaneous expulsion of a perfectly formed four months fetus. Recovery was uneventful.—*Medical Record*, October, 7, 1905.

Large Desmoid Tumor of the Abdominal Wall.—E. E. Montgomery and P. B. Bland (Philadelphia) state that the patient operated upon for this tumor was 26 years of age, married at the age of 19, and gave birth to two healthy children. The tumor first appeared seven years before operation and was observed in the lower portion of the abdomen and upon the right side, about the middle and lower thirds of the rectus muscle. The growth gradually increased in size for the first six years of its life, but during the last year it grew very rapidly. The tumor after removal measured 76 cm. in its greater circumference, and 66 cm. in its lesser circumference. It weighed 19 pounds. It had its origin in the sheath of the right rectus. It was of a pearlish pink color, of dense consistence. Microscopically it was found to be composed of young connective tissue cells. The blood vessels were numerous, and in many areas the vessel walls seemed to be composed of tumor elements. The authors review briefly the history of desmoid tumors and claim that this is the largest thus far reported. They point out that the tumors usually occur in women, and those who have borne children; frequently after childbirth, and, therefore, they believe that pregnancy and labor have some influence in their production.—*American Medicine*, Sept. 30, 1905.

Extremely Long Pregnancy.—J. Arthur Lamb, Kalispell, Mont. (*Journal A. M. A.*, September 30), gives an account of a case of preg-

nancy which lasted, dating from the last menstruation, 339 days; and dating from the last coition 313 days. These data seem to be well fixed. The cause attributed by him was a cranial deformity of the fetus, interfering with prompt natural delivery, the exact nature of which is not stated, though it is said that the brain was exposed, giving the suggestion of a breech presentation. It would have been interesting, he remarks, to have known how long this case would have gone had not quinin been given to cause uterine contractions.

The Technique of Abdominal Section.—Denslow Lewis advocates, in abdominal operations, the use of an incision large enough to enable the operator to see what he is doing; he secures perfect hemostasis throughout the operation; he turns in all raw surfaces so that only smooth peritoneum is left at the end of the operation; in pus cases removal of the source should be carried out at once, without unnecessarily prolonging the operation and endangering the patient's life. Sterile catgut is used for sutures instead of silk. After operation no opium should be given and as little anodyne as possible. The bowels should be moved early by calomel and enemata, and thirst relieved by salt solution by rectum. Uterosuspension the author disapproves of, since the symptoms are referable to metritis and other conditions, which should be relieved when the prolapsus or retroversion will be cured. In suppurations one should open and drain, but not make the operation any more severe than is necessary as the patient's strength is easily exhausted. Thorough drainage may be established through the vagina. Suppuration in peritonitis requires drainage, and irrigation is of value. In cases of rupture of the bowel or traumatism the wound should be closed at once with a Lembert suture, the edges well turned in. When part of the gut must be removed the author prefers closure of the ends and a lateral anastomosis. In ruptured ectopic gestation the sooner the abdomen is opened the better. The cesarean section should be used more frequently for contracted pelvis, etc. Small fibroids should be enucleated and for large or multiple ones supravaginal amputation is to be preferred.—*Medical Record*, September 30, 1905.

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Progress of Medical Science.

MEDICINE.

The After Treatment of Pulmonary Tuberculosis.—J. A. Wilder (Denver, Colo.) emphasizes the great tendency toward relapse and chronicity of tuberculous ulceration in the lungs as well as in other parts, e. g., the skin and bones, and thinks there is a tendency at the present time to take too optimistic a view of its curability. The disease is practically always more or less advanced from the pathological standpoint before it is recognized clinically. Although some patients have such good resistance that they recover in spite of unfavorable surroundings and methods of living, the majority require a continuous life for years rather than months under the most favorable hygienic and meteorologic conditions before there is assurance that their lesions are permanently healed. Placing the patient under proper conditions for a short time often causes the disease to become quiescent, but this is only the first step in the cure of a disease that, on account of the nature and severity of the pathologic lesions, is essentially of long duration. In an analysis of 100 cases of pulmonary tuberculosis that have been at least quiescent for from one year to ten years, the average period of quiescence being three years nine months, he finds that at the present time 87 are either quiescent or cured and able to work. Twenty-five of the 100 cases have at some time relapsed. Thirteen of these have relapsed and recovered, eight have relapsed and died, and four are at present chronic invalids. One patient died from cancer of the stomach without relapse of his pulmonary trouble. Of these cases 67 were originally classified as incipient and 33 as moderately advanced or advanced. The period of quiescence before working or returning home varies from no time to 36 months, the average being eight months.—American Medicine, October 7, 1905.

Counter-irritation.—John W. Wainwright tells us that local irritation cannot exist without causing general changes which affect the entire organism. A distant relation exists between irritation of an internal organ and that part of the skin supplied by the same segment of the brain or spinal cord. The nervous influence from the diseased organ affects the superficial areas supplied by the sensory nerves from the same segment of the cord. The most cor-

rect explanation of the action of counter-irritation, is through the reflex effect of sensitive cutaneous nerve areas on the deeper parts. Counter-irritation is used to lessen congestion and inflammation of the deeper organs, to relieve pain, and to promote the absorption of the deep products of inflammation. Rubefacients produce a mild redness and irritation, and do not destroy the skin; they are used in functional disturbances. Vesicants cause structural changes of the skin and underlying tissues, and are used in chronic conditions or when inflammation has produced a permanent change in organs or tissues. Pustulants cause a pustular eruption and are seldom used. Blisters of various kinds are useful in many conditions. The ethereal tincture of capsicum forms an elegant and effective pustulant. Blisters are contraindicated in the aged, in gout, diabetes, and debilitated conditions, and in pregnant women. They should never be applied to the mamma or scrotum or over bony prominences. They are applied over a point intimately connected by nerve fibers with the seat of inflammation. The actual cautery is one of the best means of counter-irritation.—Medical Record, September 30, 1905.

Insomnia and its Treatment.—J. Sanderson Christison says there are three principal theories of sleep: (1) Anemia of the brain and dilation of abdominal and peripheral blood-vessels; (2) autointoxication from waste products which suspend action of the brain cells; (3) interruption of currents between brain cells owing to retraction of their dendrites. No condition proved except a reduction of the flow of blood to the brain; sleep a natural appetite produced by fatigue; the senses and spinal cord only partially sleep; greatest depth of sleep in normal persons usually occurs in the second hour, while in psychopathic persons it commonly occurs towards the end of sleep. In narcotic sleep the senses are more completely shut to external stimuli than in normal sleep, while in hypnotic sleep the senses are excessively active and keen. Characteristics of the sleep of coma: In sleep respiration changes in character, becoming almost entirely thoracic, costal and more shallow. Occasionally the Biot breathing or Cheyne-Stokes rhythm may exist without any apparent significance. Nearly 40 per cent. of persons in ordinary health between 20 and 30 years of age talk in their sleep at times, and most can answer questions while asleep.—American Medicine, October 7, 1905.

SURGERY.

The Choice of Method in Operating Upon the Hypertrophied Prostate.—Willy Meyer advocates the use of the three methods in general use in operating on the enlarged prostate, according as each method fits the case to be treated. It is not wise to practise one to the exclusion of the others. Each of the methods, perineal, and suprapubic prostatectomy, and galvano-caustic prostatotomy has its own decided merits, and holds a distinct place in surgery. Operation for enlarged prostate must be urgently recommended to most patients with enlarged prostate as soon as it becomes necessary for them to use the catheter habitually. The death rate following operations is 5 per cent. or less; the mortality due to pyelonephritis resulting from self-catheterization is much greater. The author has performed Bottini's operation on fifty-nine cases, perineal prostatectomy nine times, the suprapubic operation twenty-two times. The only deaths by the perineal method were from the anesthetic in one case, and in a case almost moribund at the time of operation. Of the twenty-two suprapubic operations, seventeen cases of benign hypertrophy are living, two died of causes not due to the operation; three of cancerous hypertrophy died of causes due to the nature of the disease. The author believes that it is possible to cut the grooves with the galvanocautery both deep and wide; that median lobe is a contraindication to the Bottini operation, if it is possible to do an enucleation; the cystoscope is of value in explaining the conditions at the neck; Bottini's operation, even when done twice, does not prevent a prostatectomy, should that become necessary. But, being a purely intravesical operation, it has many failures, and sometimes entails tedious after-treatment. If radical operation is refused it should be done. When prostatectomy is done full power over the urine is obtained. A small portion of the urethral mucous membrane may have to be removed with the gland, but it is no disadvantage. There is little choice between the perineal and suprapubic routes. In the perineal operation there is a rapid return to normal control of the urine, and leakage over the abdomen is not present. The suprapubic operation can be done in less time. Cystoscopy should always be performed before Bottini's operation, as the hypertrophy may be entirely intravesical. In advanced carcinoma Bottini's operation is to be preferred, since all the cancerous metastases cannot be removed. A gland palpable by rectum and rising not far from the sphincter

muscle can best be attacked from below; when higher up and projecting into the bladder it should be operated on from above. When soft and composed of small lobes, operate from below. When complicated by a large calculus work from above. The preservation of the sexual power is important, and the suprapubic method retains it in the largest number of cases.—*Medical Record*, October 7, 1905.

Surgery of the Stomach.—Bevan (Chicago) deprecates unnecessary operations, due to too great enthusiasm of qualified operators, and the undertaking of this class of work by men who are not fitted. He then discusses surgical treatment of gastric carcinoma, and of gastric ulcer, complications and sequels. He urges for carcinoma radical removal or non-interference, and is not in favor of the palliative measure of gastroenterostomy. In technic, he prefers the suture to the use of either Murphy's button or the McGraw ligature. Ulcer is the province of the surgeon only after intelligent medical treatment fails. The complications and sequels of stomach ulcer which demand surgical treatment without question are perforation, obstruction of the pylorus, hour-glass contraction of the stomach, and such secondary conditions as perigastric adhesions and abscess, subphrenic abscess, etc. One of the sequels which must be considered is that of a carcinoma development in the ulcer. There can be but little doubt but that this does occur very frequently. Pyloric obstruction and dilation of the stomach furnish by all odds the most satisfactory groups, as far as the results from surgical treatment are concerned; these cases should practically all be submitted to surgical operation.—*American Medicine*, Sept. 30, 1905.

Cancer of the Mouth.—W. W. Grant, Denver (*Journal A. M. A.*, Sept. 30), criticises the usual operation for mouth cancer as disfiguring and only suited for small growths with large mouths. He makes, instead, two straight incisions, one on each side of the growth, connected by a straight transverse incision at the base, leaving a quadrangular space to be filled by flaps. These are formed by incisions downward and backward from each lower angle of the wound, and are separate from the inferior maxilla and united in the middle line. The angles of the mouth are incised and covered with underlying mucous membrane, no denuded surface is left, and no grafting is necessary. The chin tissues are left undisturbed unless diseased. The oblique lateral incisions permit the removal of the submaxillary glands (except the submental which may require a second incision), and the exploration of the anterior triangle can be made. He compares this method with others now employed, and points out the advantages claimed for it—the removal of the glands through the flap incisions, the absence of denuded surfaces left, the slight tension of the lip, the better cosmetic results, etc. Five cases are reported.

OPHTHALMOLOGY.

A Study of Failures in Ophthalmic Practice.

—George M. Gould sets forth the details of fifteen reasons for failures to relieve the common systemic results or reflexes of eyestrain: —(1) The want of a single good refraction school in the world. Instead of ophthalmology, being as Helmholtz said, the most accurate and scientific of the departments of medicine, he thinks it the most inaccurate and unscientific; and this is due to the lack of systematic and adequate training in the difficult art of refraction. (2) Bad case-recording, omitting the life history of the patient's ailments, or "the biographic clinic," leaves the cure or non-cure unknown or indefinite. (3) The inexperience, ignorance, or impertinence of the optician, incapable of doing his proper work, and aspiring to be an oculist, also prevents good results. (4) Changes in the patient's refraction, not followed by retesting and changes in glasses are another source of failure. (5) Incorrect diagnosis of ametropia is the most frequent cause of failure. (6) The presence of head-tilting often causes an inexact placing of the axis of astigmatism. (7) The morbid writing posture, coupled with its result, lateral spinal curvature, continue the consequences of eyestrain. (8) Non-allowance for the patient's personal equations may frequently account for non-success. (9) Tenotomy for heterophoria does not cure the cause of the heterophoria, which is ametropia. (10) Ascription of the morbid symptoms to general disease will not end in cure if they are due to neglected eyestrain. (11) Subnormal accommodation is far more frequently present than is suspected, and distance correction of the ametropia alone will not give relief. (12) "Hysteria" often caused by eyestrain may persist, when chronic, although the eyestrain has been neutralized. (13) Patients living at a distance because they cannot be watched closely, are likely to prove "failures." (14) Despair of curing in an obstinate case may lead to too speedy renunciation of effort. (15) The secondary results of long-continued eyestrain may be too chronic or deep-seated to cure at once or to cure at all. Despite all these reasons, however, it is contended that in no department of medicine are the cures so near 100 per cent., so speedy, or so gratifying as in skilled refraction work.

—Medical Record, September 30, 1905.

Asthenopia due to Latent Hyperphoria.—C. DeHayne Hallett describes a case of severe and

agonizing neuralgic headache, which had occurred frequently during a period of fifteen years. The headache would incapacitate the patient for work and confine him to a dark room for several days at each occurrence. He had been treated by two competent oculists without relief. The author found that there was a combination of astigmatism and lack of muscular balance in the eyes, the muscular error in the two eyes being exactly opposite. After correction by prisms of the hyperphoria revealed by examination, it was found that there was a larger amount of latent than of manifest hyperphoria, and an increased correction was made on two occasions, with the result of permanent relief of the headaches.—Medical Record, October 7, 1905.

Differential Diagnosis of Intraorbital Tumors.—F. B. Tiffany, Kansas City, Mo. (Journal A. M. A., Sept. 30), remarks that, as in the case he reports, a differential diagnosis of the nature of an intraorbital tumor can not always be made, but that as a rule, with careful examination and definite knowledge of all the symptoms, one can be fairly certain of the real nature of the growth. Malignant tumors run a rapid course and sooner or later cause pain, sometimes severe, and if unchecked they destroy vision and attain enormous dimensions. Benign tumors, on the other hand, grow slowly, rarely cause pain, and do not usually destroy vision, unless they produce optic neuritis and atrophy by pressure on the optic nerve. One symptom, proptosis, is common to all forms except a luxated lachrymal gland, and the direction taken by the exophthalmos indicates the locality of the tumor. If on palpation the growth is hard and immobile, it is probably osseous, especially if of slow development. If soft and fluctuating it may be serious, phlegmonous or sanguinous. If soft and yielding without fluctuation or pulsation, it may be fatty, as a lipoma. If less yielding, it may be fibroid or glandular, as an adenoma. Pulsation and bruit ceasing with pressure on the carotids characterize vascular tumors, but it is difficult to determine the varieties of pulsating tumors. The vascular are more resistant than aneurisms and patients with angioma complain of a knocking, roaring or buzzing in the head and ears. In angioma, in all cavernous tumors and in aneurisms, the exophthalmos, is reduced on pressure or when the patient takes the supine position. Tiffany reports at length a case illustrating some of the difficulties of diagnosis.

GYNECOLOGY.

A Case of Combined Extrauterine and Intrauterine Pregnancy.—H. T. Miller's patient was a woman of forty who had had two children, six and fourteen years previously. In the fall of 1904 symptoms developed which indicated an extra-uterine pregnancy, and when she came under the author's care in May, 1905, this diagnosis was made. On opening the abdomen a cystlike tumor having a pedicle containing the right fallopian tube was removed. The cavity of the sac was distended with dark colored blood and contained the remnants of a placenta and degenerated fetus. The size of the uterus gave rise to the suspicion of an intra-uterine pregnancy, which was verified on the second day after the operation by the spontaneous expulsion of a perfectly formed four months fetus. Recovery was uneventful.—*Medical Record*, October, 7, 1905.

Large Desmoid Tumor of the Abdominal Wall.—E. E. Montgomery and P. B. Bland (Philadelphia) state that the patient operated upon for this tumor was 26 years of age, married at the age of 19, and gave birth to two healthy children. The tumor first appeared seven years before operation and was observed in the lower portion of the abdomen and upon the right side, about the middle and lower thirds of the rectus muscle. The growth gradually increased in size for the first six years of its life, but during the last year it grew very rapidly. The tumor after removal measured 76 cm. in its greater circumference, and 66 cm. in its lesser circumference. It weighed 19 pounds. It had its origin in the sheath of the right rectus. It was of a pearlish pink color, of dense consistence. Microscopically it was found to be composed of young connective tissue cells. The blood vessels were numerous, and in many areas the vessel walls seemed to be composed of tumor elements. The authors review briefly the history of desmoid tumors and claim that this is the largest thus far reported. They point out that the tumors usually occur in women, and those who have borne children; frequently after childbirth, and, therefore, they believe that pregnancy and labor have some influence in their production.—*American Medicine*, Sept. 30, 1905.

Extremely Long Pregnancy.—J. Arthur Lamb, Kalispell, Mont. (*Journal A. M. A.*, September 30), gives an account of a case of preg-

nancy which lasted, dating from the last menstruation, 339 days; and dating from the last coition 313 days. These data seem to be well fixed. The cause attributed by him was a cranial deformity of the fetus, interfering with prompt natural delivery, the exact nature of which is not stated, though it is said that the brain was exposed, giving the suggestion of a breech presentation. It would have been interesting, he remarks, to have known how long this case would have gone had not quinin been given to cause uterine contractions.

The Technique of Abdominal Section.—Denslow Lewis advocates, in abdominal operations, the use of an incision large enough to enable the operator to see what he is doing; he secures perfect hemostasis throughout the operation; he turns in all raw surfaces so that only smooth peritoneum is left at the end of the operation; in pus cases removal of the source should be carried out at once, without unnecessarily prolonging the operation and endangering the patient's life. Sterile catgut is used for sutures instead of silk. After operation no opium should be given and as little anodyne as possible. The bowels should be moved early by calomel and enemata, and thirst relieved by salt solution by rectum. Uterosuspension the author disapproves of, since the symptoms are referable to metritis and other conditions, which should be relieved when the prolapsus or retroversion will be cured. In suppurations one should open and drain, but not make the operation any more severe than is necessary as the patient's strength is easily exhausted. Thorough drainage may be established through the vagina. Suppuration in peritonitis requires drainage, and irrigation is of value. In cases of rupture of the bowel or traumatism the wound should be closed at once with a Lembert suture, the edges well turned in. When part of the gut must be removed the author prefers closure of the ends and a lateral anastomosis. In ruptured ectopic gestation the sooner the abdomen is opened the better. The cesarean section should be used more frequently for contracted pelvis, etc. Small fibroids should be enucleated and for large or multiple ones supravaginal amputation is to be preferred.—*Medical Record*, September 30, 1905.

HYGIENE.

The State and Federal Public Health Services.—Fulton discusses the probable influence on state boards of health of the Federal law under which the U. S. Public Health and Marine Hospital Service is now organized. This law, he thinks, will serve the purpose which medical men have long had in mind in advancing a National board of health. Powers and privileges not heretofore accorded to other departments of state government are by this Act of Congress conferred on state boards of health. Each year the Surgeon-General must call a conference of state boards of health, and he must call an extraordinary conference whenever any five state boards of health unite in a request to the U. S. Public Health Service. The most serviceable feature of the new law is the annual conference, as the orderly and steady progress, which may be made from year to year by concerted effort, is vastly better than the reforms brought about by the drastic methods of the extra-ordinary or emergency conference. By co-operation with the Federal Bureau it is possible to bring a majority of state boards up to good standards of efficiency and to advance the standards steadily. Hitherto there have been no standards. It is the real function of the annual conference to wipe out the spectacle of confusion and discord, of high and constant efficiency in one state, alternating worth and worthlessness in another state, and unvarying inefficiency in a third state. The tendency to exempt boards of health from political spoliation is growing stronger in this country. The people begin to learn that the hygienist is a highly specialized man of science. Boards of health are less commonly regarded as useful only in times of emergency. They have found their routine, and their daily tasks to interest the public. The people themselves are now active in some of the problems of special hygiene, and the official hygienist must prove his professional fitness in the company of enthusiastic amateurs. The people demand the suppression of tuberculosis, and the enthusiasm of the voluntary associations now engaged in the American movement against tuberculosis is alarming, because it brings the hygienist into intimate relations with the sociologists, who have a body of useful knowledge about the disease and certain new ideas about its prophylaxis. These new allies will certainly discover our poverty in recorded data, in which

they are strong, and cannot fail to note the delinquency of boards of health. Strengthened by such co-operation, the forward movement of American hygiene is definitely assured. The kind and degree of success desired may not be fully attained, but the awakening of the people to the possibilities of preventive medicine means, in official life at least, the crack of doom for amateur sanitarians. (American Medicine, October 7, 1905.)

School Hygiene.—Alice M. Smith, Tacoma, Wash. (Journal A. M. A., September 30), advocates an elaborate national, state and local system of boards of school hygiene and preventive medicine. The national board composed of representative non-partisan physicians with the commissioners of education and of public health as ex-officio members, should have a general advisory and supervisory function. It should make investigations on school hygiene and publish results, be an authority on school construction and furnish plans, superintend the civil service examination of all medical men connected with school inspection and supervision, have charge of examination of school janitors and should publish circulars and bulletins of information. The state board should supervise the location and construction of school buildings, should help the national board to frame laws, should promote proper legislation, supervise the physicians holding office under the system, should have power to close unsanitary schools, decide as to the management of incorrigible children, and be the final repository of all statistics and records. The local board should supplement the state board; it should be composed of non-partisan business men and physicians, with the municipal health officer ex officio. It should keep the records of the scholars during school age, and exercise such functions as ordinarily belong to the school boards of the municipality that are not otherwise provided for. All these boards should be federated so as to have complete unity of action. She would also have the principal of a public school a graduate physician, looking after every matter concerning the health and welfare of the scholars. He should have systematic methods of entrance examinations, including family history and heredity, physical measurements and condition, etc. There should also be a county medical superintendent acting for the rural schools, and the system outlined by Dr. Smith also includes social organizations for the education of parents, distribution of pamphlets of instructions, industrial homes for the incorrigible, etc. Such a system, if carried out, she thinks would go far to prevent epidemics, to decrease crime and to develop the mental, moral and physical condition of the community. It would put physicians in their proper professional relations to society and open up a wide field of usefulness to an overcrowded profession.

BACTERIOLOGY AND PATHOLOGY.

Cylindroma of the Orbita and Lids—J. E. Weeks, New York (Journal A. M. A., September 30), reports two cases of this type of tumor, characterized by the formation of hyaline cylinders and tubules, both occurring in the orbit or eyelid. He remarks that these tumors contain tissue developing from both mesoblastic and epiblastic tissues and are, therefore, properly mixed tumors, but that the hyaline change is so characteristic that the retention of the name cylindroma is justifiable. From the reported cases these growths seem to be less malignant than ordinary sarcoma and carcinoma, but they require very thorough removal. If the osseous tissue is involved it should be removed. Metastases are rare. The age incidence ranges from 17 to 72 years in the reported cases. A number of cases have developed after traumatism.

The Action of Acid-fast Bacilli When Inoculated into the Peritoneal Cavity of White Rats.—Randle C. Rosenberger (Philadelphia). All the inoculations were made into the peritoneal cavity. The animals were killed, some in 30 days and others in 54 days. Nodules or tubercles were constantly produced in the peritoneal cavity and in one or two cases nodules were produced in the parenchyma of the liver. Segments of the pancreas adjacent to sections of the liver or spleen showed lesions. The heart, lungs, kidneys and intestines remained exempt from the infection. Histologically the nodules in all the animals were identical, being made up of large, more or less oval, slightly granular cells; lymphocytes, spindle-shaped cells, and polynuclear leukocytes. In some sections were cells possessing 10 to 12 nuclei, for the most part peripheral, the others being in the center of the cell. Newly formed tissue was evidenced by the presence of a large number of small blood-vessels and blood sinuses limited by the cells already mentioned, principally the oval and spindle-shaped cells. In some of the masses small foci made up entirely of polynuclear elements and suggesting pyogenic infection were present. None of the animals showed illness or emaciation at any time and they apparently would have lived indefinitely. Similar experiments upon guineapigs were entirely negative. Cultures obtained from the lesions produced the same phenomena in a second series of white rats. The organisms used were Moeller's grass bacillus Nos. 1 and

2; Korn's grass bacillus Nos. 1 and 2; mist bacillus, horse dung bacillus, milch bacillus, Karlinski's bacillus, blindachleichen bacillus, Grassberger's butter bacillus, Petri Rubinovitch bacillus, B. tuberculosis piscum and marginin bacillus.—American Medicine, Sept. 30, 1905.

Fasciolopsis Buskii.—J. T. Moore and J. J. Terrill, Galveston, Texas (Journal A. M. A., Sept. 30), report finding this rare intestinal parasite. This, the first case on record outside of Asia, occurred in a Lascar sailor from an English steamer, who died in a Galveston hospital. The parasite was found at the post-mortem made to verify the diagnosis of typhoid fever, which was confirmed. The symptoms attributable to the parasite are unknown, but it probably causes intestinal irritation and possibly anemia. Siles' descriptions, generic and species, are reproduced in full. The interest of the finding is largely in the possibility it indicates in its introduction into this country. As it requires particular species of snails to act as intermediate hosts in its native home, it is by no means certain that such introduction is possible.

An Apparently Distinct and Hitherto Undescribed Type of Parasite in Pernicious Malaria.—H. M. Smith reports the finding in the blood of 119 cases of malaria at the First Reserve Hospital, Manila, P. I., a parasite so peculiar and distinct from any previously described as to render it probable that this form is a distinct type of the parasite of pernicious malaria. The parasites are small hyaline discs of an oval spindle form, nonpigmented and lying in the protoplasm of the red blood corpuscles. They have a very sharply defined outline, are highly refractive, and in the center of each form is a small round dot of hemoglobin. Their short diameters vary from 1-5 to 1-10 the diameter of the red blood corpuscle, their long diameters being about twice as great. On account of their spindle shape he designates them "spindle forms." They have no ameboid motion, but move by revolving on their long axis and by swinging around on their short axis, using one end as a fixed point. This motion is the most peculiar characteristic of the parasite. They stain with great difficulty and then only the periphery to a slight extent. No development of any nature has been observed in these parasites, and no forms besides these "spindle forms" were ever discovered in the blood before death or in the blood and organs after death in the four fatal cases.—American Medicine, October 7, 1905.

THERAPEUTICS AND PHARMACOLOGY.

The Local Treatment of Rabies.—Konradi, in the *Centralblatt fur Bakteriologie*, believes that the development of rabies can be prevented by 1-1000 bichloride solution applied to the site of inoculation. Application should be within 12 to 30 minutes, but may be of value after that time. The virulence of rabid virus is reduced by the antagonism of the organism. Individual susceptibility must be reckoned with in laboratory experiments, as well as in practice.—*The Practitioner*.

The Disagreeable Odor of Ichthyol.—A drug too valuable to be neglected on this account, can be concealed by the addition of oil of citronella, 20 minims to the ounce of ointment.—Ex.

Atony and Associated Pathological Conditions of the Rectum and Colon; With Mechanical Methods of Treatment.—Fenton B. Turck advises the use of massage and stimulation of the atonic intestine by the use of small rubber bags inserted in the rectum and sigmoid flexure, and inflated with air. The inflation can be used steadily for the desired amount of time, or the bag may be alternately relaxed and inflated again, thus producing a kind of massage of the intestine. Atony of the intestine is the result of fatigue toxins generated by the intestine, and antitoxins may also be generated, which will restore the intestine to its normal condition. The toxins of fatigue are not dializable, and remain where they are formed. Massage hastens the union of antitoxins with toxins. The abdominal circulation is also an important factor in atony of the intestine, and massage by inflation stimulates the circulation. Drugs, surgery, general gymnastics, and the various mechanical methods of treatment have all failed in curing atony. The injection of air confined in the rubber bag places the amount of distension to be used under the operator's control. It may be made intermittent. Hemorrhoids, ulcers, proctitis, all are benefitted, as well as prolapse of the bowel, and various associated uterine conditions. The results of the author's experience have shown that the restoration of function in the intestine is permanent.—*Medical Record*, October 7, 1905.

Prevention of Chloroform Sickness.—Denue, of Bordeaux, points out in *La Presse Medicale* that in every chloroform narcosis, a by no means inconsiderable amount of

chloroform reaches the stomach by reflex acts of swallowing, and exerts there an irritating effect, which expresses itself as vomiting during and after the narcosis. He has introduced a plan of making every patient about to take chloroform, drink a certain amount of water before hand in order to dilute the chloroform swallowed, and so prevent the irritation and its effect. Beginning an hour and a half before the operation the patient drinks a glass of water every half hour, taking the last glass immediately before the administration begins. Four glassfulls are taken, about 28 ounces. The results have been excellent, for not a single patient has vomited, or showed signs of nausea during or after the operation.—*The Practitioner*.

Hot Salt Solution for Ulcers.—Dr. A. Veyrassat, of Geneva, writes in the *Revue Medicale de la Suisse romande*, June, 1905, on the use of hot physiological salt solution for the treatment of ulcers of the leg, which he extols, over all antiseptics. These, if strong enough to be bactericidal, must necessarily cause death of the tissues already lowered in vitality. The salt solution, 7-1000, used at a temperature of 50°C. has a physiological effect on the tissues promoting phagocytosis, and at the temperature employed is fatal to some bacteria though not to spores. The ulcer is irrigated with the hot solution for a quarter of an hour and a sterilized dressing (gauze, cotton-wool, and bandage) is then applied. This is done daily until the ulcer cleans, then as often as necessary. Healing proceeds rapidly, and the method is especially suitable for cases which cannot afford the time to lie up in bed.—*The Practitioner*, September.

Magnesium Treatment of Cavernous Tumors.—A few years ago E. Payr recommended as one of great efficacy a method for removing inoperable cavernous tumors by means of magnesium pencils inserted in the growth. Tollens (*Zeitschrift fur Chirurgie*, Vol. 77, Nos. 1 and 3) reports his experience with the method in an angioma of the skin on the arm of a four months' old child. A number of thin magnesium pencils were thrust through a small opening in the skin directly through the tumor and permitted to remain in place. No diminution in the size of the growth could be demonstrated, and as it was, on the contrary, increasing in extent, it was excised four weeks later in several sittings with favorable results. Subsequent examination of the tissues showed that the magnesium produced very little reaction, and in this case, at least, the method must be looked upon as a failure. (*Medical Record*, Sept. 30, 1905.)